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As the Editor Views the News

THE atmosphere of Detroit is charged with the buoyant spirit of returning prosperity. Everywhere the signs of restless activity (p. 16) are reminiscent of the palmy days of the predepression period. But the illuminating point in connection with this Utopian condition is that the hustle and bustle apparently have pushed the contemporary annoyances of business and politics into the background. Strike trouble, which loomed so ominously several weeks ago, is forgotten. The hectic debates of Washington seem almost as remote as the bickering of central Europe. Significantly, anti-new deal sentiment is growing about as rapidly as signs of reviving activity are increasing.

• • •

Crazy Quilt Freight Rates

In trying to adjust their daily business operations to the new freight rates, industrial companies are experiencing the usual confusion which occurs when federal and state agencies disagree on methods. Several states have sanctioned intrastate increases paralleling the interstate advances authorized by the interstate commerce commission. A few states are standing on the 30-day notice clause and others have not yet acted. The result is a hopeless tangle (p. 10) of conflicting rate situations, with unwarranted hardships for some shippers and undeserved benefits for others. We have a long way to go in our effort to design a mechanism for handling freight tariffs promptly and equitably.

• • •

Haste May Make Waste

When General Johnson appeared before the senate finance committee to testify in regard to the extension of NIRA, he made a point which should be considered carefully by all critics of the basing point system. He explained that the system of multiple bases has been in effect some time (p. 13), that it was introduced under the watchful eyes of the federal trade commission, and that a great part of the expenditure for plant and equipment was allocated according to the requirements of this system. The General, perhaps more than any other new dealer and certainly more than some critics, sees the danger of changing the rules too abruptly. Even within the bounds of the administration of the steel code, we have evidence that the sudden change of minor regulations seems to make necessary adjustments of far-reaching character.

• • •

Tough Spot For Umpire

Most of the criticism against the basing point system and against certain price provisions of the code have originated with companies west of the Indiana-Illinois state line. The first appeal from the ban on the construction of steelmaking capacity (p. 11) comes from that territory. The fight against Pittsburgh-plus was instigated from the same district. Companies in this midwestern area want to hasten the westward drift of the industry. Eastern producers want to retard its movement. The only possible man-made solution would seem to be a compromise which will not impose sudden hardships on either side. Ultimately, economic law will settle the argument decisively.

• • •

Time Element Is Factor

Open-hearth operators attending the recent annual meeting in Cincinnati devoted considerable discussion to the length of time ingots should be held after pouring. Moving them too quickly after teeming (p. 46) was said to cause the formation of interior defects. More testimony on the satisfactory use of copper stools (p. 48) was presented . . . At Dayton, O., members of the American Society for Metals discussed (p. 39) problems involved in heat treating metals with controlled atmospheres — a subject of unusual interest at this time . . . Pressure blocks (p. 43) applied between screwdowns and the upper rolls and fitted with recording indicators afford rolling mill operators valuable data on rolling pressures. They destroy certain fallacies regarding the rolling of extremely thin material.

E. L. Shaner

Freight Rates in Tangle as States Lag in Matching ICC

THE freight rate map began to look like a patchwork quilt last week as the emergency advances authorized by the interstate commerce commission became effective April 18 on interstate shipments while the states were indecisive or antagonistic to comparable rises on intrastate movements.

So far as could be determined, up to the end of last week only five important industrial states—Illinois, Indiana, Maryland, Massachusetts and New York—had sanctioned intrastate increases paralleling interstate ones, which for iron and steel are 7 per cent up to a maximum of 2 cents per 100 pounds, and 10 per cent on switching charges.

Wisconsin has taken a negative position. Ohio has refused to publish increases on short notice, and some other states that already have had hearings are also standing on 30-day notices. Other states have not yet held hearings. Of course, the failure of many states yet to act is not to be construed as an adverse attitude.

Traffic Men Up in Air

In the meantime, many confusing situations are arising, and traffic managers are exasperated at the tangles, most of which should be adjusted within several weeks. Some revisions already have been made in delivered prices on iron and steel, which are reflected in quotations on pages 54-58 of this issue.

In Ohio an unusual situation has arisen through refusal by the state public utilities commission to authorize a surcharge on intrastate rates short of 30 days statutory notice from railroads.

For the present, this is virtually excluding iron and steel shipments into Ohio from some important outside production centers; and further, it is actually resulting in higher prices being received by Ohio manufacturers on some steel products.

Of course, the reverse is true where the Ohio mills attempt to sell in those adjacent states, Michigan, for instance, where state boards also have invoked the 30-day ruling.

How it is working out may be shown by a few specific examples. Cleveland is a base for steel bars. In selling in Ohio, the Cleveland bar producer is unaffected by the ICC surcharge. The rate from Cleveland to Canton is 10.5 cents per 100 pounds.

From Lackawanna, N. Y., the rate to Canton was 22.5 cents, and this now has been increased 7 per cent, or 1.57 cents. This surcharge amounts to 31.5 cents per net ton, which the producer must absorb, in addition to the freight differential he customarily assumed, in order to reach Canton.

The Cleveland base price on steel bars is 1.85c. To sell in Canton in competition with Cleveland, Lackawanna must be content with a mill price of 1.71½ cents, or $2.70 less per net ton than the Cleveland producer.

How the present set-up gives a Cleveland producer a higher price for his product is indicated by the following example:

Cleveland is not a basing point for plates, and the Pittsburgh base is used. Plates are 1.80c, base, Pittsburgh. The freight on carlots from Pittsburgh to Canton has been 16.5 cents per 100 pounds, and the 7 per cent surcharge brings this to 17.65c, and raises the delivered Canton price which the consumer must pay to 1.9765c per pound.

When a Cleveland plate mill sells to a Canton consumer he deducts from this delivered price the actual freight from Cleveland to Canton. He has been receiving 1.85½c per pound, mill.

Now, as there is no surcharge in Ohio, he continues to deduct 11 cents, but from a higher delivered price, and as a result he receives 1.866c per pound mill. The difference is equivalent to 22 cents per net ton, for the seller.

This is strictly according to code and basing point provisions, and in line with the present freight rate regulations.

Pittsburgh steel producers now find themselves in the position where they must absorb the extent of the surcharge to all points of delivery where they sell on other than a Pittsburgh base. The Pennsylvania public service commission, meeting April 22 and 23 at Harrisburg, Pa., has strongly intimated it will follow Ohio's example, thus giving Pittsburgh mills the advantage of maintaining present intrastate Pennsylvania rates unchanged.

Must Absorb Higher Rate

An example of how Pittsburgh mills will be forced to absorb the increase lies in a producer there selling bars, as an instance, in Toledo, O. The delivered price there is the Cleveland base on bars plus the rail freight from Cleveland to Toledo.

However, shipping interstate as the Pittsburgh bar producer must, he will be forced to make the same delivered price to his Toledo customer.

In order to do so he will have to absorb the same amount of freight as before and in addition, the surcharge. This is despite the Ohio public service ruling of April 16, as the latter affects only shipments originating within Ohio and for ultimate destination within Ohio.

Even though Pennsylvania follows Ohio's example, the Pittsburgh mill is forced into some inequalities when it attempts to sell, for example, in Philadelphia. This is obviously an intrastate movement. But many Pittsburgh steel shippers move their products to Philadelphia by way of the Pittsburgh & Lake Erie, New York Central or Erie. This type of freight moves for a period through New York; on it the shipper will have moved interstate and thus be subject to the surcharge.

Also, on Pittsburgh steel products

Status of State Action on Freight Rate Advance

Alabama—Hearing on carriers' application scheduled for May 7.
Arkansas—Hearing on carriers' application April 18.
Georgia—Hearing to be held later.
Illinois—Intrastate emergency charges approved, but 10 per cent increase in switching rates within Chicago switching district will not apply. This exception, however, will not apply on movements from Illinois to Indiana within the switching district, and vice versa.
Indiana—Same action as Illinois.
Louisiana—Hearing held April 19.
Mississippi—Hearing expected to be held some time in May.
Michigan—Hearing held April 16 but no action taken.
Maryland — Intrastate application emergency charges approved effective April 18.
Massachusetts—Intrastate application emergency charges approved effective April 18.
New Jersey—Has suspended intrastate increase until July 15; hearing scheduled for May 2.
New York—Emergency charges effective April 18 except on coke, which were made effective May 17.
Oklahoma—Hearing to be held but date not definitely set.
Ohio—Carriers' application for authority to publish on short notice refused.
Pennsylvania—No action taken but public service commission scheduled to meet April 22 and 23.
Tennessee—Hearing held April 19.
Texas—Hearing to be held but date not definitely set.
Virginia—Hearing to be held later.
West Virginia—Hearing scheduled for April 23.
Wisconsin—Has refused intrastate advance.

destined for export at Philadelphia, the surcharge will apply. Even though the rail shipment part of this movement is entirely intrastate, the commission has ruled that the surcharge will apply.

All arbitrary rates delineated by the steel code will not be affected by the surcharge. Steel producers at Pittsburgh will continue to charge their arbitrary switching charges as set down in the steel code.

They will also continue to adhere to equalized prices as set up for Detroit and eastern Michigan. To do so, however, a further freight absorption will be forced on the Pittsburgh maker.

Thus, Pittsburgh mills are in the position where they must bear the major brunt of the increase, regardless of the action of surrounding states' service commissions in ruling on their respective intrastate rates.

Also, on steel shipments sent down over the Ohio river by barge to southern points, by which route Pittsburgh producers move considerable tonnage, there will accrue a slight benefit to the Pittsburgh steelmaker. Barge shipments under the steel code are figured as a percentage of the all-rail rates and under the operation of the basing point system, steel, delivered in the south by this method would of course be figured on a Birmingham, Ala., base.

Illinois Voids Switching Extra

Shipments within Illinois will take the higher freight rates authorized recently by the ICC to apply on interstate shipments. In allowing the application of the emergency charge to intrastate shipments, however, the commission has eliminated the 10 per cent increase authorized on switching rates within the Chicago area. This exception will not apply on movements from Illinois to Indiana points which may lie within the Chicago switching area and vice versa.

Action taken by the Indiana commerce commission is similar to that in Illinois, the higher intrastate rates becoming effective. Wisconsin, however, has eliminated the emergency charge on intrastate deliveries. In those instances where an arbitrary delivered price has been set up under the steel code, such as Chicago delivered quotations on steel products manufactured in this area, there will be no change, the usual switching charge of 60 cents a net ton continuing.

At New York, delivered prices on steel bars, sheets and certain other items, based at Pittsburgh, are advanced 2 cents per 100 pounds; and on plates and shapes, based at Coatsville and Bethlehem, Pa., respectively, a little more than 1 cent, with prices carried out the fourth decimal. Pig iron prices at both Brooklyn and Newark, N. J., have been increased approximately 16 and 10 cents a ton, respectively.

New York has suspended advances on intrastate rates on coal and coke to May 17. New Jersey has suspended all proposed increases on intrastate rates until July 15, with a hearing scheduled for May 2. This latter decision leaves delivered prices on by-product coke at Newark, N. J., unchanged.

An interesting development has been the at-least temporary shift of the basing point on ferromanganese for delivery to Pittsburgh from Baltimore to Philadelphia, due to the fact that Baltimore now takes the higher freight rate.

Affected by the advance in interstate rates, the Baltimore-Pittsburgh rate is $5.13, whereas the existing rate from Philadelphia to Pittsburgh, in intrastate traffic, is unchanged at $4.99. This shift in rates brings the delivered Pittsburgh price up 20 cents to $89.99.

On the heavier products delivered at most New England points, the maximum 2 cents per 100 pounds will be added to the delivered price, although plain structural material will be a fraction of a cent less at Boston and even less at points nearer Bethlehem, Pa.

On wire products based at Worcester, Mass., the rise of 7 per cent of the former freight rate will apply. No increase will apply on scrap delivered at several important consuming points, notably Worcester, the carriers being competitive with trucks. Points on the New York, New Haven & Hartford railroad taking pig iron shipments from Everett, Mass., will also benefit by failure to apply the increase.

Would Lift Ban on New Steel Capacity

FIRST application for exemption from the provisions of the steel code which prohibit the construction of new open-hearth or bessemer steel capacity has been filed by the Northwestern Barb Wire Co., Sterling, Ill.

This proposal of the Northwestern company to become integrated results from its conviction that price provisions of the steel code are discriminatory and that its existence is threatened unless it installs steelmaking and finishing capacity.

Prior to the advent of the steel code, a differential on wire rods enabled the Northwestern and similar companies to maintain themselves in competition with their integrated competitors, according to Paul W. Dillon, president of the Northwestern company.

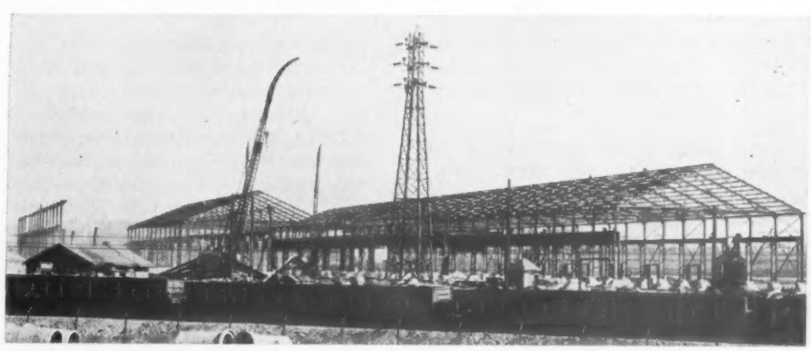
The code provides an allowance of $5 a ton under the base for wire rods to manufacturers of woven wire fencing, bale ties and similar products, but makes no provision for such manufacturers as Northwestern. Says Mr. Dillon:

"We have been seeking relief from this situation ever since the inception of the code, without success, and apparently our only recourse to keep from being legislated out of business, which this company has been engaged in for over fifty years, is to install steelmaking equipment so that we will no longer be at the mercy of the large self-integrated mills.

"We could, of course, install rod mills and purchase billets, but we would still be at the mercy of the controlling interests in the steel business who could at any time use the price control regulations of the code to file ("fix") prices on billets and finished common wire products, that would place us in exactly the same position that we are now in.

"We have not been seeking publicity on this for we have felt that it is something that should be adjusted within the industry, rather than to be placed in the hands of politicians

The "Big Top" for New Carnegie Mill



Structural steel is rising fast for the building to house the new 42-inch wide strip mill which the Carnegie Steel Co. will install at its McDonald (Youngstown), O., plant. The main building is 1408 feet long

who might do more harm than good through lack of complete knowledge of all the inter-related factors within the industry that must be considered.

"However, we naturally are going to put up a fight for existence and continuance of a business that has been in operation over fifty years and employs over a thousand men and has become a definite established source of supply to the trade whom we serve.

"While we realize that there is a lot of idle steel capacity in the country, a lot of this capacity is old and more or less obsolete, and we do not see any economic gain for the country at large in our continuing to support or pay for this old, idle steel capacity *at the expense of our own salvation.*"

No statement is made by the Northwestern company as to its exact program, but in Washington it was said steelmaking capacity of 100,000 tons annually is contemplated. For several months it is rumored that a tentative order has been placed by the company for a 22-stand continuous rod mill.

Under the code only steelmaking and not steel finishing capacity is prohibited, except when the prohibition is suspended by the President. Many millions of dollars are going into finishing capacity. Latest development is the proposal of the American Rolling Mill Co. to add a wide cold strip mill, on which an announcement may be made shortly

Labor

TUESDAY at Pittsburgh the Amalgamated Association of Iron, Steel and Tin Workers annual convention gets under way—a series of meetings which may last several weeks.

A lively battle within the ranks is promised in view of the expulsion Feb. 3, which still stands, of the "rank-and-filers" by officials of the Amalgamated under President Michael F. Tighe.

Through last week, the "rank and filers," determined to put on as bold a front as possible, made the claim that they had added some 4500 new members in the Pittsburgh district in the past three months, but conservative observers were prone to question the statement in view of the total Amalgamated membership of only 6500 to 7000.

MARCH SETS 4-YEAR PEAK IN METALWORKING EMPLOYMENT

Metalworking employment during March at 22 leading centers was at the highest level in nearly four years, according to the monthly report of the National Metal Trades association, Chicago. Last month's index of 70.1 compares with 69.1 in February, 67.7 in March, 1934, and 46.2 in March, 1933. The previous high mark of the past three years was 69.5 in May, 1934.

Production

ADVANCED 1 point to 46 per cent last week, owing to strength in the Pittsburgh, Youngstown and Buffalo districts, which more than offset declines at Chicago, Cleveland and Birmingham. Details follow:

Youngstown—Rose 3 points to 58 per cent last week, but is expected to dip to 56 per cent at this week's start.

Chicago—Despite minor fluctuations, the average for the past week remained at 50 per cent, practically unchanged from the rate of the preceding week. Blast furnace operations also are unchanged, with 14 of the district's 36 steelworks stacks active.

Central eastern seaboard — Unchanged at 29½ per cent, with little variation expected over the near future. Plate makers at the moment are producing ingots at about as low a rate as any time this year, with one taking off an open-hearth, leaving four. Finishing operations in general appear to be a shade better.

Birmingham—Off 1 point to 54½ per cent, due to one open hearth being taken off. This pace will be continued for several weeks.

Buffalo—Up 3 points to 37 per cent, with expectation of further slight gains in the near future. Fourteen open hearths are in production and all probably will continue to make ingots throughout the month. One or two additional units may be lighted toward the end of the period.

Pittsburgh—Up 2 points to 36 per cent last week, with heavy demand for tin plate, sheets and many wire products, mainly fencing, being leading supports to local operations. Twenty out of 60 blast steelworks furnaces continue active.

Wheeling—Unchanged last week at 76 per cent, with 28 out of 37 open-hearth furnaces in this district continuing on active schedule.

Cleveland-Lorain—Down 2 points to 62 per cent, Otis Steel Co., taking off one open hearth to operate 6; Corrigan, McKinney Steel Co. continuing with 11, and National Tube Co., Lorain, 7.

New England—Held at 52 per cent last week, but is scheduled to go lower this week. While one works will increase 20 points, other producers in the district are scheduled for sharply reduced open-hearth operations.

Detroit—With three open hearths still down, steelmaking continued at 82 per cent.

Steelmaking Operations

Percentage of Open Hearth Ingot Capacity Engaged in 10 Leading Districts

	Week ended April 20	Change	Same week 1934	Same week 1933
Pittsburgh	36	+ 2	43	21
Chicago	50	— ½	54	23½
Eastern Pa....	29½	None	40	14
Youngstown...	58	+ 3	60	23
Wheeling	76	None	73	†
Cleveland.....	62	— 2	74	36
Buffalo	37	+ 3	57	25
Birmingham..	54½	— 1	52	20
New England	52	None	89	†
Detroit	82	None	94	†
	46	+ 1	55	25

†Not reported in 1933.

Capacity Analysis Available

An enlargement of the table breaking down the capacity for making leading steel products by cities, which appeared in STEEL for March 18, pages 24 and 25, is being made available by STEEL. The enlargement is 17 x 20 inches, satisfyingly legibile, suitable for framing or under glass desk tops, and will be mailed rolled. Single copies are 30 cents, postpaid. Prices on quantities will be quoted on request. Address Readers' Service Department, STEEL, 1213 West Third street, Cleveland.

Merger

ENTIRELY fantastic" is the characterization by the Republic Steel Corp. and the Corrigan, McKinney Steel Co., both of Cleveland, of the government's suit attacking their merger, in a joint reply brief filed in federal district court, Cleveland, April 15.

The government's contention that the Clayton act forbids a corporation from buying the assets and business of another corporation, where the consideration of purchase is stock of buying corporation, is assailed. A decision by Federal Judge Fred M. Raymond is expected to be handed down about May 1.

Housing

A HOUSING program designed to produce one new house for each 100,000 of population throughout the country by Sept. 1, has been launched by the General Electric Co., Schenectady, N. Y., with the announcement of its home building program.

The general plan is to offer selected builders new ideas, prize-winning drawings, substantial discounts and terms on electrical equip-

ment, and national advertising and support, all in consideration of the construction by these builders of demonstration style houses.

The company is already assured of the co-operation of the Federal Housing administration and of numerous builders, publishers and banks. The houses are to be opened this fall to the public during September and October.

An outgrowth of the recent General Electric architectural competition, in which more than 9000 architects submitted some 2000 sets of drawings, the program will be carried out through committees formed in the various sections of the country this month.

J. F. Quinlan, who was in charge of the architectural competition, will head up the new organization for the building program, with headquarters in New York.

Transportation

SOUTHERN carriers April 17 filed exceptions with the interstate commerce commission in connection with a proposed report dealing with iron and steel article rates between the North and the South.

The examiner in this case found that rates are justified. The carriers state that "the evidence of the record overwhelmingly supports such findings. When consideration is given to decisions of this commission wherein they have prescribed rates on iron and steel articles it follows that rates on such articles proposed herein from the North to the South are not unreasonable."

The petition filed with the commission by official territory carriers in connection with docket 17,000, part 12, dealing with nonferrous metals, asks that the commission issue an order permitting them to establish 42 cent per 100 pound rates from East St. Louis, Ill., to Perth Amboy, N. J., and Laurel Hill, N. Y., effective on one day's notice, with the understanding that rate will expire June 19, and thereafter, effective June 20, rates will be invoked as prescribed by the commission in decision docket 17,000.

Structural Code

IN SPITE of the fact that the structural steel code has been under discussion for many months and that Donald Richberg recently stated that the National Industrial Recovery board would have to take action shortly, it is rumored that final action on the code will be held up until a new NRA is written or until the Supreme Court rules on the poultry case.

Johnson Mildly for Basing Points; NRA Hearings End

STEEL basing points and deficits were highlights in the testimony of Gen. Hugh S. Johnson, first administrator of NRA, when he took the stand before the senate finance committee Thursday in concluding the senate's probe of NRA.

The general urged that the life of NRA be extended. He started by reading from an 88-page statement, and few were the industries and topics he omitted. On basing points:

"The basing point system of the steel industry existed under the federal trade commission long before NRA. The steel industry was built up on it.

"The vast installations were located where they are because of it. It is not single in the steel industry. Dozens of industries have it in different forms. Every manufacturer maintaining branch houses and selling f.o.b. branch does it.

"I have always condemned it. The first thing I did when I took over a big industrial company was to abolish it.

"But you can't do that in government—by fiat—after you have sat twiddling your thumbs for 21 years, as the trade commission has and allowed titanic industrial clusters to be built up on that basis.

"What NRA did was to require an increase in basing points in an already-operating basing point system. It was the only way to handle the situation. By a gradual accommodation to a mill base, you can eliminate the practice, allowing a reasonable time and an intelligent administration to prevent chaos and destruction."

General Johnson then put into the records exhibits which he stated were a compilation of 20 small steel companies advocating continuation of the system.

"I accept it as it was handed to me," he stated. "and propose it for the record although some of the companies do not look exactly like pygmies to me.

"I think it has also been called to your atention that 1934 corporate returns show most little fellows in the steel industry getting out of the red, while the big ones are still running deficits—five big ones in the red and 25 medium and small companies, in the aggregate operating in the black."

Dealing with price fixing and open prices, General Johnson said:

"I believe in no price fixing but in a general principle that a consistent practice of selling below cost is suspect. I hope to see developed a method of open price posting with no waiting period but absolute publicity of all quoted prices, terms, rebates and discounts.

"If we could have that, then anybody who wanted to make a complaint of predatory price slashing could do so, and if the accused couldn't explain his prices he would be ordered to cease and desist.

"But open prices have been another popular target of late. There are two phases of the open price question. One is that it gives competitors in an industry an opportunity to know market conditions, i. e., the prices which they have to meet in order to get their fair share of business.

(*Please turn to Page* 74)

◆

Labor got the breaks and industry the grief from July, 1933, to February, 1935, according to a study of fundamental labor and cost factors by the National Industrial Conference board, New York, presented in the accompanying chart. Most striking is the fact that labor costs per unit jumped 44.8 per cent in this period, or 8.8 points more than payrolls

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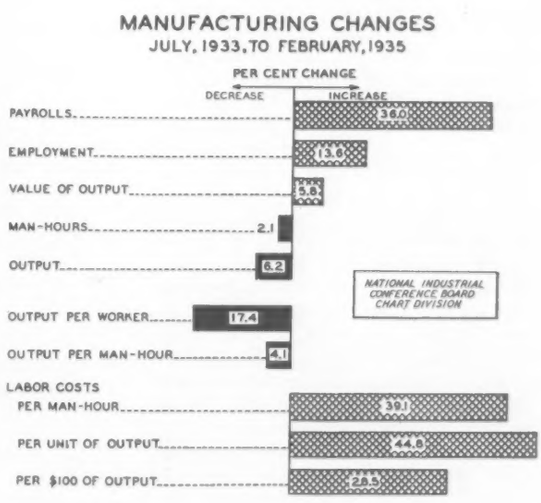
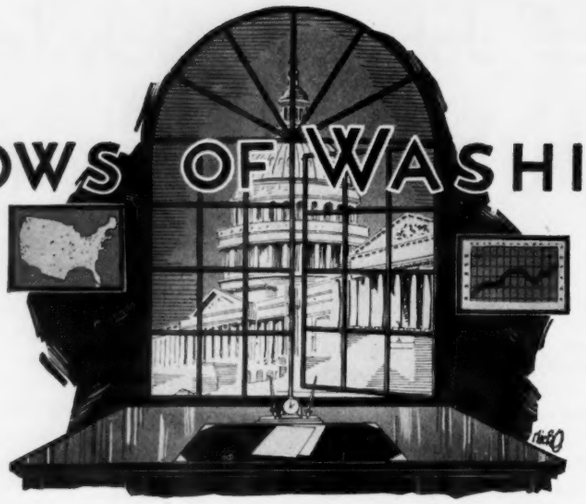


WINDOWS OF WASHINGTON



WASHINGTON

THE question of getting materials on new projects is one of the things that will hold back immediate action on works under the various sections of the new five billion dollar act, according to the White House.

Even at that, inside of a few months the railroad crossing projects should be pretty well under way. Some of them will get to a much quicker start than that, it was stated at a recent White House press conference, because certain railroads and certain states (whose names were not mentioned) already have their plans drawn.

In spite of the fact that the President will try to put as many men to work as possible under the new law, there is no question but what huge amounts of iron and steel will be needed. For one thing, it will be impossible to eliminate grade crossings without structural steel and to build roads without reinforcing bars.

Two Versions of Progress

There has been considerable dissatisfaction among the politicians on Capitol Hill at the slowness with which the President is going ahead with this work program; on the other hand, he seems to feel that he is progressing rapidly, and so stated last week. He is conferring frequently with both Messrs. Ickes and Hopkins.

For instance, it was pointed out by the President that Secretary Ickes has had worked out details of information which will have to be filed with the federal government by municipal governments making applications for loans under this bill. The information asked will, among other things, demand the number of men the project will take and just what the time schedule will be.

Incidentally, the President stated in no uncertain manner that he will look with favor on applications for loans rather than of actual gifts. He said that his problem would be to get back as much of the five billion dollars as possible. In other words, he will try to be the typical "Yankee trader" on behalf of the government.

Mr. Hopkins in terms of this new law is now engaged in finding out definitely just how many unemployed there are. The President is not satisfied with estimates which he has from various government departments and he may take some of the money allotted for white collar workers' relief in having them take a census of unemployment, all to be done at the same time and in a few days and to cost from $12,000,000 to $15,000,000.

Mr. Hopkins also is engaged, it was stated, in rechecking the unemployment lists and in districting the country for unemployment.

In trying to work out the various allotments, the President has announced that he will hold round table conferences at which representatives of various boards, departments and commissions, will sit, and even the small projects will have their day in court.

He explained in this connection that every possible way of spending money will be given a fair hearing. Application for various projects are now in the government's hands, the President stated, amounting to between sixteen and twenty billions of dollars. Of course, practically none of these has been sifted out yet.

At the time this is written no details are available of the expenditure of the five billion. It is expected, however, that some statement on the administration of this fund will be made in a short time.

HULL CLAIMS BELGIAN PACT GUARDS AGAINST DEVALUATION

Secretary of State Hull, worried by the attacks on the Belgian trade agreement, has announced that the government provided for reduced currency in that country when it negotiated the agreement.

The state department says that Belgium has given assurances that it intends to supervise the prices quoted by Belgian exporters with a view to preventing serious disturbances detrimental to American interests. The department shows further that in the agreement itself a loophole was left, as follows:

"In the event that a wide variation occurs in the rate of exchange between the currencies of the United States of America and the Belgo-Luxemburg Economic Union, the government of either country, if it considers the variation so substantial as to prejudice the industries or commerce of the country, shall be free to propose negotiations for the modification of this agrement or to terminate it on thirty days' written notice."

NO BAN ON IRON IMPORTS; TARIFF CLAUSE DEAD LETTER

Industry gained practically nothing from section 3e of the recovery act which congress enacted in order to help industry on imports when the codes made it easy for the foreigner. The latest proof of this is in the complaint of the pig iron people. The President has ordered that no further action be taken on their complaint.

It was filed by a tariff committee representing the eastern group of merchant pig iron producers by authority of the American Iron and Steel institute. The announcement says that the decision was made after an examination of the complaint and a report by the recovery board.

Pig iron is imported into this country chiefly from Netherlands and British India. The trend of imports, both in absolute amount and in ratio to domestic production of merchant pig iron, has been generally downward from the second quarter of 1933 before the adoption of the steel code.

"Furthermore," NRA say "com-

petition from imports on a price basis was less severe during 1934 than during 1932 and 1933 prior to the depreciation of the dollar."

Although many applications have been made to NRA under this section of the act, in only one or two cases has any benefit been granted the manufacturer.

PROVE NAVY'S TOOL NEEDS

It is reported here unofficially that the latter part of new month officials of the navy department will visit all navy yards in the continental United States to determine the machine tool needs of each yard.

These officials will also discuss with officials of each yard the best type of tools for the work on hand at that particular yard and manufacturing processes and methods. The fact that such a survey is about to be made would seem to indicate that the navy department hopes to get some of the five billion dollars for the purchase of machine tools for the yards.

AGAINST FEDERAL CONTROL OF IRON ORE RESERVES

While approving the policy of retaining ownership of mineral deposits in the public domain, to be administered under the leasing system, the minerals planning committee of the national resources board, which recently made a thorough study of natural resources, does not recommend extension of public ownership at present to deposits of iron, coal, oil, copper, lead, and zinc, already in private hands.

Whatever the abstract merits of public ownership may be, the committee points out, private ownership "is so firmly entrenched by law and custom as a national policy that the practical difficulties alone of any general reversal of the status quo at this late date appear insuperable."

The committee indicates that further research is required on reserves of low grade manganese bearing ores and, if it can be shown that adequate supplies can be made available by new processes and costs somewhat above world prices, careful consideration should be given to the advisability of tariff protection.

NORBECK PROPOSES $500,000 FOR MANGANESE SURVEY

A bill has been introduced in the upper house by Senator Norbeck, of South Dakota, "to provide for a survey of the manganese ore resources of the United States", which has been referred to the committee of mines and mining.

The bill authorizes the United States bureau of mines to make an immediate survey of the manganese resources of this country, to conduct test drilling, to determine the approximate tonnage contained in various deposits, to build and equip testing plants and to conduct experimental operations, provided "that not to exceed $50,000 shall be expended in any one state for such purposes."

The bureau of mines is authorized under the bill also to make contracts with corporations etc., to carry out this work. Under the bill the President also is authorized to allocate to the bureau $500,000 of relief money for the purposes of the act.

National Income in 1934 47.6 Billions, Up 13.9%

NATIONAL income—the net value of goods and services produced—was $47,600,000,000 in 1934, an increase of 13.9 per cent over the $41,800,000,000 in 1933, states the National Industrial Conference board, New York.

Comparing 1934 with 1929, when national income reached a peak of $83,000,000,000, the income level was off 42.7 per cent, wholesale prices 21.4 per cent, and the cost of living 20.6 per cent. The purchasing power of 1934 national income thus was 27 per cent below the pre-depression peak.

Per capita income in 1934 was $377, or 44.8 per cent below 1929 in dollars and 30 per cent below in purchasing power. Average income produced per gainful worker, including unemployed, was $946 in 1934, against $1719 in 1929.

Warner & Swasey Salesmen Report Improvement

Marked improvement in the machine tool portion of the durable goods industries as reported last week by salesmen from every part of the country, representing the Warner & Swasey Co., machine tool builders, Cleveland in Cleveland for their annual sales conference and meeting.

According to C. S. Stilwell, vice president and sales manager, the improvement is apparent throughout the United States and especially so in the states bordering on the Great Lakes.

"We consider this fact especially significant," said Mr. Stilwell, "because these central states are the home of a large part of the nation's heavy industries. The pickup in this section might well be interpreted as meaning that these heavy industries are again coming into the market for machine tool equipment."

Convention Calendar

April 24-25—Association of Iron and Steel Electrical Engineers. Spring engineering conference at Ohio hotel, Youngstown, O. T. B. Little, Empire building, Pittsburgh, is acting managing director.

April 25—American Welding society. Annual meeting at Engineering Societies building, New York. M. M. Kelly, 33 West Thirty-ninth street, New York, is secretary.

April 29-May 1—Concrete Reinforcing Steel institute. Eleventh annual convention at Homestead hotel, Hot Springs, Va. R. W. Johnson, 201 North Wells street, Chicago, is secretary.

May 14—Machinery and Allied Products institute. Annual meeting at Hotel Cleveland, Cleveland. Alexander Konkle, 221 North LaSalle street, Chicago, is assistant secretary.

May 14-15—American Gear Manufacturers association. Annual meeting at Penn-Lincoln hotel, Wilkinsburg, Pa. J. C. McQuiston, Penn-Lincoln hotel, Wilkinsburg, Pa., is manager-secretary.

May 14-16—American Steel Warehouse association. Twenty-sixth annual convention at Edgewater Beach hotel, Chicago. Walter S. Doxsey, 442 Terminal Tower, Cleveland, is secretary.

May 15-16—National Metal Trades association. Convention and exhibit in Cleveland. Harvey S. Flynn, 122 South Michigan avenue, Chicago, is secretary.

May 19-23—National Electrical Manufacturers' association. Spring meeting at Homestead hotel, Hot Springs, Va. R. J. Blais, 155 East Forty-fourth street, New York, is secretary.

May 20-23—National Associaton of Purchasing Agents. Annual convention and exhibit at Waldorf-Astoria hotel, New York. George A. Renard, 11 Park Place, New York, is secretary.

May 22—Porcelain Enamel institute. Annual meeting at Statler hotel, Cleveland. Kurt R. Groener, 612 North Michigan avenue, Chicago, is executive secretary.

May 23—American Iron and Steel institute. Spring meeting at Hotel Commodore, New York. Walter S. Tower, 350 Fifth avenue, New York, is executive secretary.

May 24—American Society for Metals. Special sectional meeting of New York, Philadelphia, New Jersey and Lehigh Valley chapters at Hotel Pennsylvania, New York. T. N. Holden, 1219 Glenwood road, Brooklyn, N. Y., is secretary at New York.

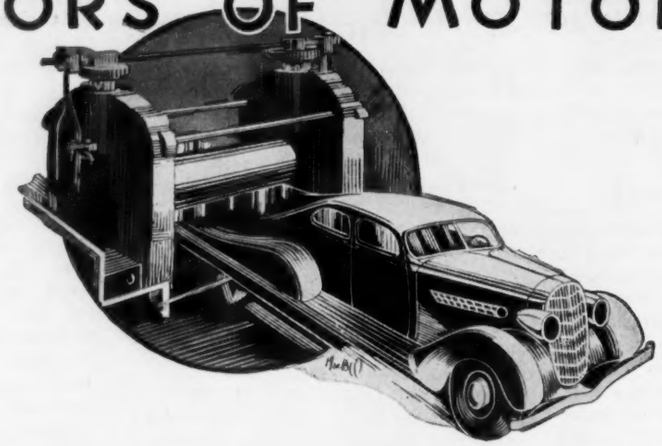
June 6-7—Gray Iron Founders' society. Meeting at Hotel Gibson, Cincinnati. Henry M. Halsted Jr., Public Square building, Cleveland, is executive vice president.

June 10-13—American Electro-Platers' society. Annual meeting at Stratfield hotel, Bridgeport, Conn. H. A. Gilbertson, 234 South Wabash avenue, Chicago, is secretary.

June 24-28—American Society for Testing Materials. Thirty-eighth annual meeting at Book-Cadillac hotel, Detroit. C. L. Warwick, 260 Broad street, Philadelphia, is secretary.

Aug. 19-23—American Foundrymen's association. Thirty-ninth annual convention at Royal York hotel, Toronto, Ont. C. E. Hoyt, 222 West Adams street, Chicago is secretary.

MIRRORS OF MOTORDOM



DETROIT

BUSINESS men with frayed nerves and a complex that the ship might as well sink and get the agony over with should come to Detroit. It's 1929 here, and everywhere the phenomena of bustling times are apparent.

Most significant, of course, is the fact that automobile production has snapped back to the level of the autumn of 1929. Weekly reports of assemblies topping 100,000 units read like the good old days.

True, there is now a greater concentration of demand in the low-price field, and a few medium and high-price car manufacturers are fighting for their lives, but taking the industry as a whole, all of the production ground lost during the depression has been recovered.

BUILDING COMES TO LIFE

Even more encouraging, expansion is in the air. Ford is spending $20,000,000 at the Rouge. Great Lakes Steel will put almost $15,000,000 into its new mills. Including these improvements and some apartment and theater building definitely scheduled—and what other city is building theaters and apartments?—a total of $64,000,000 is in sight for new construction.

While not exactly chargeable to Detroit, Olds at Lansing is increasing its capacity by 50 per cent, and Chevrolet has just opened its 80,000-car assembly plant at Baltimore. Fisher Body has some expansion plans maturing.

Electric refrigerator manufacturers are just over the peak of the best season they have ever had. Already pressed to meet delivery requirements for the automobile industry, body makers are diversifying by embarking on the fabrication of pressed steel, chiefly for household uses.

Labor is a topic rarely mentioned except by outsiders. The A. F. of L. is no longer considered a threat. There is a little flurry over the formation of an industrial association at the Dodge plant, but it seems to be independent of the federation and of communists, and has yet to prove its virility.

Railroad freight traffic into Detroit since the first of the year has been heavy enough to recall practically all idle train crews. The demurrage Ford has been paying would be a handsome profit for many a small parts manufacturer.

GOING PLACES, DOING THINGS

Passenger traffic out of Detroit, especially in the late afternoon and early evening, calls for more parlor cars. High-powered executives fume over their inability to get promptly into the half-pint diners some roads are now operating out of Detroit.

Not for several years has the passenger list on the night steamer from Cleveland been so heavy early in the season. Freight to Detroit and new cars from it warrant the Detroit-Cleveland line in scheduling day trips and a converted bulk freighter besides.

Nobody has yet had to spend a night in Grand Circus park owing to inability to obtain a hotel room, but floors that have been closed during the depression have been reopened.

Lunch hour finds the General Motors-Fisher restaurants and concourse jammed in a manner reminiscent of 1929, and at few places in the United States can so many brisk young executives and trim stenographers be seen.

Home office officials of companies supplying the automotive industry, who forsook Detroit for several years both to save expense and because there was no business, are flocking back. It is an even chance now when you drop in on a vendor to find him out with someone from the home office.

Night clubs (we are reliably informed) are doing a flourishing business, there is more entertaining of customers, and home office auditors are much more broadminded about expense accounts than they were a year ago.

Parts of Woodward avenue look like the trenches of Verdun, as a street widening program progresses. Office buildings and churches have literally had their faces cut off 20 to 30 feet, and some of the smartest and also the most lurid fronts in enameled steel yet erected in this country are becoming visible on Woodward avenue.

Purchasing lobbies are filling up again, and a wait of three hours in some is not unusual. One well-known P. A. last week was so far carried away by the spirit of spring and recovery that he admitted that steel prices are too low; for obvious reasons his identity will be zealously guarded from his employer and other P. A.'s.

The real estate market has turned. Rents are higher and bargains in residential property are rapidly disappearing. Many a Detroit sales representative who gave up a room or two of his office to save rent has now returned to normalcy.

UNEARTH LOST PROSPERITY

In numberless other ways, also, Detroit has regained its tempo. Theater business is reported the best of any city outside of New York. A deluxe lunch club of automobile executives that folded up during the depression has reopened, although on a more modest basis. Golf clubs report an increase in membership. It takes pull to get into the Detroit Athletic club without waiting half a year. Panhandlers consider themselves privileged to feel aggrieved when liquor on their breath repels a dime. Street car and bus traffic is noticeably heavier.

No longer should the continued presence of apple vendors on street corners and in building lobbies be considered an earmark of depression This profession has as nearly achieved permanancy as anything can, and apparently will satisfy many temperaments during prosperity.

Postmaster General Farley and the Democratic political brain trust would become genuinely alarmed were they to take unbiased soundings in Detroit.

It is only recording fact to state that anti-administration sentiment has been growing in just about the proportion that prosperity, or what now passes for it, has been returning. The recent election was virtually a Republican landslide, and men who are not captious are openly talking about the defeat of Mr. Roosevelt next November.

It may or may not be a concomitant of better times, but automobile publicity men are now pressed as much to satisfy the demand for free tickets to radio program concerts as they are taxed to get out blurbs.

General Motors deemed it cheaper to bring a 75-piece orchestra from New York to Detroit for the Easter Sunday evening concert than to transport the General Motors chorus of 400 from Detroit to New York. But it neglected to reckon with the fact that only 4600 spectators could be accommodated, and nearly 30,000 applied.

An automobile dealer from Podunk and points west feels privileged to drop in, either in Detroit or New York, upon the radio program of his manufacturer on five minutes' notice and receive the best seats in the house.

LAST week's announcement that the Ford Motor Co. of Canada had made a net profit of $1,878,112 in 1934, after taxes, compared with a deficit of $620,700 in 1933, was accepted in Detroit as confirming the understanding that the Ford Motor Co. went into the black last year.

Like Ford of Canada, Ford (of the United States) went into the red in 1931. Its profit in 1930 was $44,460,823. The deficit for 1931 was $53,586,000; in 1932, $74,861,644.

In 1933 the deficit was whittled to $3,923,524, and it seems likely that the 1934 net was at least $25,000,000. A general report will be made shortly to New Hampshire authorities, but the complete detail of Ford's financial experience for 1934 will not be revealed until the comprehensive report to Massachusetts authorities is made about June.

FORD POLICIES UNIQUE

For the period 1930 to 1933 inclusive, the net showing of Ford was a loss of approximately $77,910,345. By way of comparison, Ford's most profitable year was that ended Feb. 28, 1923, with a net of $119,298,862, while 1932, with a deficit of almost $75,000,000 was the worst.

Ford's financial philosophy—and Detroit believes it is a sincere one—probably was best expressed when W. J. Cameron, his personal spokesman, said recently on the radio that while Ford seemed to lose some $68,000,000 in one year (he evidently was referring to 1932) the fact was Ford was only putting that much more money into circulation than he took out.

No other large manufacturer has undergone such a metamorphosis. Mr. Ford still appears to be a lone wolf so far as many problems of the automobile industry are concerned, but the fact is he co-operates quietly more than is generally known. His "personal" letter advertising two years ago did much to personalize his industry, while Mr. Cameron's radio talks have added a "homey" touch to Ford publicity. It is a case of the largest manufacturer trying to become an individual entity to the public.

And Detroit's rapid recovery owes much to Ford. Disbursements for materials and supplies in March exceeded $81,000,000, the former high being $78,000,000 in April, 1930. Last month's payrolls totaled $16,500,000. This week Ford will probably turn out the 500,000th 1935 model, achieving half of the goal set for this year.

ASSEMBLIES gained again last week, reaching 110,235 units, still the highest since August, 1929. Ford at about 39,000 was holding at 6500 units daily, 6 days a week. General Motors, assembling 39,725 units, increased about 225, principally in Chevrolet. Chrysler was again stationary, at about 19,775 cars. Retail sales support this production, and real spring buying weather is just appearing.

Look for a new Nash and a new Lafayette shortly, each to be lower-priced than anything now available in either line. . . Fisher Body has increased its use of oxyacetylene welding. Since the advent of the turret all-steel top it is using oxyacetylene welding for brazing interiors.

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1933	1934	1935
Jan.	128,825	156,907	292,765
Feb.	105,447	231,707	340,544
Mar.	115,272	331,263	410,000*
3 mo.	349,544	719,877	1,043,309
Apr.	176,432	354,745	.....
May	214,411	331,652	.....
June	249,727	308,065	.....
July	229,357	266,576	.....
Aug.	232,855	234,810	.....
Sept.	191,800	168,871	.....
Oct.	134,683	132,491	.....
Nov.	60,682	78,465	.....
Dec.	80,565	183,187	.....
Year	1,920,057	2,778,739	.....

*Estimated.

Estimated by *Cram's Reports*

Week ended:

April 6	107,895
April 13	109,337
April 20	110,235

Died:

EDGAR FIELD PRICE, 62, retired vice president of Union Carbide & Carbon Co., New York, in Port Chester, N. Y., April 15. Born in Leaksville, N. C., at the age of 17 he became associated with Willson Aluminum Co., Spray, N. C., successors of which formed the nucleus of Union Carbide.

He later was affiliated with the Westinghouse Electric & Mfg. Co., and subsequently Union Carbide Co. He ultimately became president of the latter, as well as executive head of Electro Metallurgical Co. When Union Carbide & Carbon was formed in 1917, he was appointed a vice president, retiring in 1925.

♦ ♦ ♦

David H. Smith, 68, president of David H. Smith Steel Co. Inc., Brooklyn, N. Y., and a leading figure in the steel warehouse industry since 1894, in Brooklyn, April 18.

♦ ♦ ♦

Charles E. Birch, 64, at one time associated as pig iron salesman with Mathew Addy & Co., Cincinnati, and with H. H. Adams & Co., New York, in Stamford, Conn., April 13.

♦ ♦ ♦

Nils I. Lundberg, 53, for 28 years mechanical engineer of the Gisholt Machine Co., Madison, Wis., April 11. Born in Soderham, Sweden, he came to this country in 1906 to join the Gisholt engineering staff.

♦ ♦ ♦

R. C. Lind, 79, founder and president of the Rockford Machine Tool Co., Rockford, Ill., in that city, April 13. He was a pioneer manufacturer in the district, coming from Sweden in 1891 and founding the machine tool company in 1905.

♦ ♦ ♦

Edward M. McIlvain, 71, from 1901 to 1904 president of the Bethlehem Steel Co., and retired in recent years, in New York, April 18. In 1898 he became associated with the old Bethlehem Iron Co. and was general sales manager when R. P. Linderman was president. When Charles M. Schwab obtained control of the company in 1904, Mr. McIlvain resigned and later was associated with a Canadian interest.

♦ ♦ ♦

Charles H. Read, 88, prominent in the early steel industry around Pittsburgh, in Los Angeles, April 12. In 1879 he engaged in the steel casting business under the name of Read & Thaw, Pittsburgh. Later this concern was moved to Johnstown, Pa., and Mr. Read became assistant general manager of the Cambria Iron Co. He resigned in 1885, returned to Pittsburgh and assisted in organizing the Duquesne Steel Co., Duquesne, Pa. He was active in the steel business until 1915, when he retired.

Industrial Men in the Day's News

Walter Mathesius, General Superintendent, South Works, Illinois Steel Co.

Educated in Germany, he has come up through the ranks of steelmakers to a pre-eminent position today.

For 23 years he has been at South Chicago, much of this time directing blast furnace operations there.

As general superintendent, he now has charge of one of the largest blast furnace and steel plant units.

WALTER MATHESIUS, new general superintendent of the South works of Illinois Steel Co., South Chicago, Ill., is one of the ablest steelmakers in this country today.

Born in Germany in 1886, he was educated at the Institute of Technology in Berlin, graduating in 1911 with a doctor of engineering degree. He then came to this country and was employed in the physical laboratory of the Worcester, Mass., plant of American Steel & Wire Co.

In 1912 he removed to South Chicago where he became affiliated with the blast furnace department of the South works of Illinois Steel. He was made assistant superintendent of blast furnaces there in October, 1915, and superintendent in February, 1917. Eight years later he was appointed assistant general superintendent of the blast furnace department.

At this time he became active in the development of alloy steel production at Illinois Steel. Four years later he was named assistant general superintendent of the entire works, in which capacity he continued until his recent promotion, when he succeeded George L. Danforth, resigned.

A member of the American Iron and Steel institute, the American Institute of Mining and Metallurgical Engineers and the American Society for Metals, he is a past chairman of the Chicago chapter of the latter organization.

♦ ♦ ♦

C. L. Schultz, formerly storekeeper at the Follansbee, W. Va., works of Follansbee Bros. & Co. Inc., Pittsburgh, has been appointed purchasing agent of the company, succeeding R. B. Perry.

♦ ♦ ♦

E. Kapke is now assistant sales manager of the crane division of Harnishchfeger Corp., Milwaukee.

♦ ♦ ♦

G. Lofberg has been appointed president of SKF Steels Inc., New York. N. S. Peterson has been named secretary.

♦ ♦ ♦

F. C. Pahlow, for nearly 25 years manager of the Great Lakes Engineering Works, Ashtabula, O., has resigned, effective May 1.

♦ ♦ ♦

W. C. Cruetzburg has been appointed to the engineering and planning department of Young Radiator Co., Racine, Wis., to take charge of tool design.

♦ ♦ ♦

Myron C. Taylor, chairman of the United States Steel Corp., New York, sailed April 19 for his annual visit to principal European offices of the corporation. He expects to spend some additional time in Italy.

♦ ♦ ♦

John A. Callahan, for more than three years actively identified with the Briggs Mfg. Co., Detroit, has been appointed to take complete charge of all operations of the company's new plumbing division at Hamtramck, Mich. He has directed the company's development work in plumbing for more than two years and has had a wide training in both the manufacturing and selling fields. The Hamtramck plant, remodeled and equipped for large scale production of plumbing ware, is scheduled to begin operations shortly.

♦ ♦ ♦

William C. Farr, president of the McKinney Mfg. Co., Pittsburgh, in 1928, and since then secretary and treasurer, was presented with a silver plaque April 17 on occasion of his fiftieth anniversary with the company.

♦ ♦ ♦

Floyd Rose, vice president and general sales manager of Vanadium-Alloys Steel Co., Latrobe, Pa., has been elected president of the Pittsburgh Rotary club for the year beginning July 1.

♦ ♦ ♦

E. E. Bolds, for 10 years associated with Ludwig Hommel Co., Cleveland, handling sales and service on equipment of the American Electric Furnace Co., Boston, effective May 1 will be affiliated with Anderson-Bolds Inc., 1836 Euclid avenue, Cleveland. This organization will now handle equipment of American Electric Furnace.

A. A. Anderson, also with Ludwig

John R. Walker

Who as noted in STEEL for April 15 has been appointed to succeed T. Lane Watson as salesman in charge of domestic inquiries in the general sales department, rail and billet bureau, Carnegie Steel Co., Pittsburgh. Mr. Walker has been a clerk in the Detroit sales office of Carnegie. Mr. Watson has been named assistant manager of Carnegie sales in the Cleveland district

Hommel for a number of years, is associated with Mr. Bolds.

♦ ♦ ♦

F. M. Randlett, Pacific coast manager of Robert W. Hunt Co., consulting engineer, Chicago, has been appointed vice president and general manager of the company at Chicago.

M. H. Merrill, since 1919 president of the M. H. Merrill & Co., consulting engineer, San Francisco, and for the last three years consulting engineer for the Hunt company, has been named western manager at San Francisco.

♦ ♦ ♦

Arthur H. Oberndorfer has been named advertising manager of the Hevi Duty Electric Co., Milwaukee. For several years he held a similar position with the Sivyer Steel Casting Co., Milwaukee.

♦ ♦ ♦

Arthur C. Hays, 1415 Carondelet building, New Orleans, has been appointed sales representative in the New Orleans district for the Edward Valve & Mfg. Co. Inc., East Chicago, Ind.

♦ ♦ ♦

Bernard H. Porter has become associated with the technical department of the Acheson Colloids Corp., Port Huron, Mich., his headquarters to be at 444 Madison avenue, New York.

♦ ♦ ♦

Richard V. Bonomo, L. Schiavone-Bonomo Bros., Jersey City, N. J., has been elected president of the New Jersey chapter of the Institute of Scrap Iron & Steel Inc. Two new vice presidents have been elected—A. J. Reichman, Reichman & Hoffman Bros., Newark, N. J., and James J. Brady, Federal Iron & Metal Co.

♦ ♦ ♦

R. F. Black, for over four years president of the Brockway Motor Truck Corp., Cortland, N. Y., has been elected president of the White Motor Co., Cleveland, succeeding A. G. Bean who has been made chairman of the board. Mr. Black is a well-known figure in the motor truck industry, at one time being vice president of the Mack-International Motor Truck Corp., New York.

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R. M. Roosevelt, vice president in charge of the New York office of Eagle-Picher Lead Co., Cincinnati, will now devote his entire time to duties as president of the American Zinc institute.

Willard E. Maston, vice president of Eagle-Picher, has been placed in charge of the New York sales division of the company.

F. W. Potts, vice president, has been named general manager, and John R. MacGregor, vice president of the Eagle-Picher Sales Co., will be in charge of sales research and product development.

T. C. Carter, with the company 17 years, is now director of sales.

Andrew M. Ondreyco

Who as announced in these columns last week has been appointed chief metallurgist of the Meehanite Metal Corp., Pittsburgh. Since 1924 he has been operating metallurgist and adviser for Westinghouse Air Brake Co., Wilmerding, Pa.

Activities of Steel Users and Makers

BANTAM BALL BEARING CO., South Bend, Ind., has experienced an increase in shipments for first quarter of 1935 of about 50 per cent over first quarter of 1934, about 400 per cent over the corresponding period of 1933. All divisions have contributed to this, but one of the most active has been that producing quill rollers, at 10 to 15 million per week, largely for automotive use. This type bearing has been installed on wristpins in diesel engines for the Burlington Zephyr and Union Pacific streamlined trains, the Bantam company being the chief source of supply for these bearings.

To meet steady increase in demand for heavy duty bearings of tapered and straight roller type, largely for steel mill use, this department has increased facilities 50 per cent. In process at present are 16 massive roller bearing pillow blocks to support the main sheaves on the great railway lift bridge across Cape Cod canal. These blocks will weigh 144,000 pounds and support a radial load of over 500,000 pounds each. They are 52½ inches high, 16 inches wide and 60 inches long (see p. 32).

The Bantam company has also recently furnished a large number of special bearings for Boulder dam and Fort Peck dam and other federal projects.

♦ ♦ ♦

Lima Metal Products Inc., Lima, O., manufacturer of refrigerator cabinets and metal stampings, has been organized recently and has bought from the receiver the land, buildings, equipment and inventory of the Lima Sheet Metal Products Co., taking possession of the property April 1. Before that date development had been completed on a standard line of refrigerator cabinets of three, four and six-cubic foot capacity and production will be started at once. The new company is not a reorganization of the old one.

♦ ♦ ♦

Truscon Steel Co., Youngstown, O., is beginning fabrication of 22,000,000 wire staples for the New Orleans army engineers, to be used in fastening wire mesh mattresses used in bank protection work on the lower Mississippi river.

♦ ♦ ♦

R. G. Moeller Co., 14415 Meyers road, Detroit, has been appointed by Link-Belt Co., Chicago, distributor of its crawler shovels, cranes, draglines and locomotive track-type cranes. R. G. Moeller is president of the company.

♦ ♦ ♦

Cutler-Hammer Inc., Milwaukee, manufacturer of electric controls, is completing the first quarter with improvement of fully 33 per cent over the same period last year. Employment has increased to 2500 persons, compared with a peak of 3300 in 1929. NRA regulations are responsible for much of this increase.

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Thomas Prosser & Son, New York, importers and distributors of Widia cemented carbides, has opened an office at 7310 Woodward avenue, Detroit, in charge of E. R. S. Reeder, district manager. The new office will give increased facilities for prompt service for users of this material in blanks, cutting tools and wear-resisting parts.

♦ ♦ ♦

Carbide & Carbon Chemicals Corp., 205 East Forty-second street, New York, has placed its new plant at Whiting, Ind., in operation. It is located on a 30-acre tract with space for expansion. Completion of this plant is a further step in development of the company's chemical production. It grew out of fundamental research in organic chemistry related to the possibility of manufacturing new products from hydrocarbon raw materials. The plant at South Charleston, W. Va., is also being enlarged.

♦ ♦ ♦

Cleveland Tractor Co., Cleveland, has been awarded a contract by the government for 608 tractors of 55 horsepower and 57 tractors of 35 horsepower for use in road and trail

(Please turn to Page 73)

European Steel Trade Gains Despite Tariff, Gold, Cartel

DISTURBING factors, of recent occurrence, have retarded the forward movement toward prosperity that was hoped for at the beginning of 1935.

In the political sphere, Germany's bid for military strength has brought about a feeling of apprehension among continental nations, which adds its quota to existing factors of uncertainty which have already restricted trade.

In the economic sphere, the step taken by Belgium in going off the gold standard is the first visible cleft in the gold-bloc structure.

The necessary readjustment following upon the results of the Saar plebiscite also has created difficulties with regard to the European steel entente, and further complications have resulted from the increase in the British tariff, at a time when it was hoped that an arrangement could be reached between British and Continental steel manufacturers.

The immediate effect of the recent disclosure of Germany's military strength has been the decision of Great Britain, Italy, France and other countries to increase their armaments, and this will translate itself into greater steel demand by ordnance departments, naval yards, airplane and automobile factories.

Many Difficulties Met

Indirectly, it would also seem that a greater measure of economic cooperation between Soviet Russia on the one hand, Great Britain and France on the other may result from conversations between representatives of those countries, following the Berlin interview between Sir John Simon and Herr Hitler.

The departure of Belgium from the gold standard had been expected. Belgium depends to a large extent on exports of industrial products, of which iron and steel constitute one of the main items. The depreciation of the pound in 1931 was a blow to Belgium, because Great Britain is one of her principal markets for steel products, and Belgium competes against Britain in India, South Africa and South America.

The imposition of the British tariff in 1932 was a still more serious setback to Belgian steel exports; the total exports of Belgian iron and steel to Great Britain dropped from 959,843 tons in 1932, when the tariff only began to give its effect, to 500,274 tons in 1933 and 602,620 tons in 1934.

The increase in British tariff duties effective in March was almost a deathblow to the Belgian steel trade in the British market; furthermore, the gradual decline of sterling in relation to gold currencies, as well as keener competition from America and Japan, has rendered Belgium's hold on overseas markets less secure. It was known for some time that Belgium's industrial and trading conditions were becoming increasingly difficult, and, therefore, her action in devaluing the belga was not altogether unforeseen.

At the time of writing, the belga has been devalued by about 28 per cent, and the effect on Belgian quotations for foreign markets will almost counteract the protective effect of the increase of British tariffs against foreign steel. This naturally causes uneasiness in British circles. It should be pointed out, however, that the tonnage of iron and steel imported into Great Britain since the beginning of the year, and before the increase of duties, has tended to decrease, whereas British exports of iron and steel have tended to increase.

IN SPITE of difficulties resulting from the British advance in import duties on steel, the abandonment of the gold standard by Belgium, uncertainty of continuance of the steel cartel and other unfavorable factors, the situation in the steel industry in Europe is becoming better, according to the accompanying review of conditions during the first quarter of 1935, by Vincent Delport, European representative of STEEL. *Difficulties still beset the industry, especially in Continental countries, but Great Britain seems to be improving its position materially.*

The imposition of the higher duty on steel by Great Britain was announced just a few days after the meeting of representatives of the cartel and of the British steel industry, at Cannes. The coincidence seems to be rather unfortunate, because the conversations at Cannes, although not followed by definite results, took quite a favorable turn.

The British were prepared to allow for a considerable tonnage of continental steel, 700,000 tons, according to certain reports, to be imported into the British market. Continental producers want more, about 900,000 tons. However, the margin was becoming narrower, and it was hoped that a closer agreement would be reached at a subsequent meeting in the near future. The increase in the British tariff, although known to be in the air, came as a bombshell, and this action proved distasteful to Continental producers, who may now harden their attitude.

There is no doubt conditions in the British iron and steel industry have seriously improved in recent months, and that Britain is now in quite a strong position. The reason given for the higher tariff is that the industry is now being organized on the lines previously stated, that this reorganization can be brought to its logical end only if the British producer is assured of protection against cheap foreign steel, and that most of the 1,336,660 tons imported in 1934 could be profitably made in British works. Apparently the government is satisfied that material progress in reorganization has been made, and that the protective tariff will not be taken as an excuse for unduly increasing prices for the domestic consumer. At present, the prospects of the British home steel industry are quite fair, and the railroad companies are now coming into the field with important contracts.

Germany Barters Exports

In Germany, conditions are also fairly satisfactory as far as production and activities are concerned. Considerable export trade is effected by barter arrangements, and this is causing some concern in steel cartel circles, since it would seem that such arrangements enable Germany to capture business beyond her normal quota. Unemployment is still rife in Germany, however, and the figure is well over two million.

Conditions in Italy are difficult. In order to protect the lira, Italy has put a ban upon imports, which now are considerably restricted within certain quotas. Barter trading with other countries is also being arranged. Some activity has been noted lately in connection with war material, and the home steel trade generally is fairly active.

Belgium, Luxemburg and France have been finding it increasingly difficult to export steel products, owing to competition from countries that are not linked with gold. Belgium may now find a certain measure of relief, at least temporarily.

The recent breaking up of the continental tube cartel is an ominous event, which tends to show that in this specialized field the various points of view could not be made to converge. It is still hoped that entente negotiations will eventually be concluded satisfactorily, if only because of the beneficial influence of its operation in recent years, which is almost unanimously recognized.

EDITORIAL

Who—Besides Politicians—Favors Wagner Bill?

AN IMPORTANT question which requires a lot of explaining is why the Wagner disputes bill seems to be favored so strongly in Washington while in all other sections of the country it is thoroughly and unequivocally condemned.

Three groups are primarily and legitimately concerned with the provisions of this proposed bill. They are the employes, the employers and the general public. The government administration and the members of congress are the elected representatives of the individuals who comprise the employe, employer and general public groups. Presumably their attitude toward the Wagner bill should reflect the attitude of their constituents in these classifications.

That there is a serious discrepancy between the two has been apparent since the beginning of the present session of congress. Convincing evidence is available to show that no substantial demand for the Wagner bill is current among industrial employes, that all employers are unalterably opposed to it and that public opinion—while sincerely sympathetic to advancing the interests of the American worker—is beginning to realize that those persons in Washington who pretend to be working for his welfare in reality are harming him.

Vociferous Leaders Really Speak for Small Minority of Industrial Employes

The idea that the prominent officials of A. F. of L. are the accredited spokesmen of the industrial employes of this nation is absurd fiction, yet numerous senators and representatives accept without question the implication that these A. F. of L. leaders truly represent American employes. Certainly many new dealers have done everything within their power to foster this deception. However, sooner or later the fact will dawn upon congressmen that the great majority of employes have no desire to be affiliated with any professional union (government supervised elections show that 75 per cent of employes desire no professional union representation). Moreover, congressmen will learn that only one out of seven employes are in professional unions and that the A. F. of L. leaders really represent only a small minority.

Therefore it is folly to assume that pleas for the Wagner bill put forth by Mr. Green are evidence that a majority of employes are in favor of it.

Employers—almost to a man—are against the Wagner bill. Recently the Associated Business Papers and the National Conference of Business Paper Editors conducted a survey to ascertain the attitude of the principal industries toward the proposed legislation. The editors of about 125 business publications responded. They reported in detail upon the consensus of opinion in their respective fields. The survey shows conclusively that every branch of industry represented in the study is opposed to the bill, and that in a great majority of them the prevailing opinion is that there is no existing need for legislation such as Senator Wagner proposes. Also, the view is held in many industries that the bill would provoke labor relations discord instead of promoting industrial peace.

Industrial employers unquestionably stand united against the proposal.

American Public Begins To Suspect Sincerity of Self-Appointed Labor Spokesmen

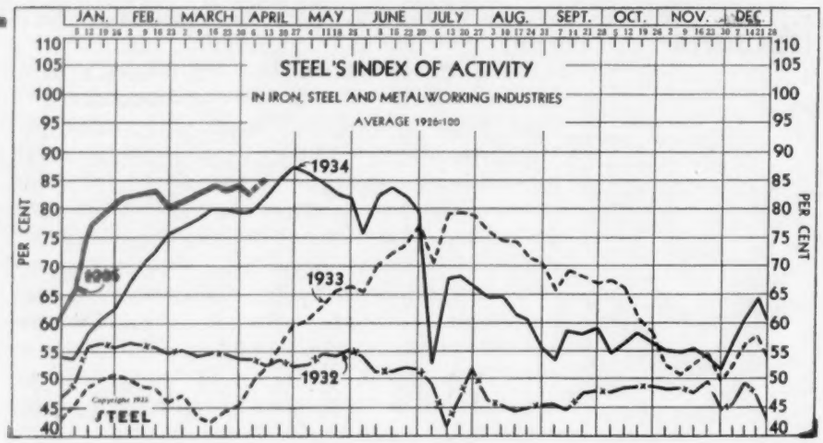
Thus far the public has not voiced its attitude toward the bill. The man in the street has not concerned himself to any great extent with the inside details of the problem of employe relations. In general, he is for anything that will help the worker.

In recent months, however, he has compared the loud talking of A. F. of L. speakers with the terms of settlement of the numerous attempted strikes in which A. F. of L. has participated. He is finding that the two do not jibe. The leaders are vociferous, boastful, arrogant. But in the settlements the members of A. F. of L. have not received any tangible benefits, other than the customary face-saving clauses. In view of this discrepancy between promise and deed, the man in the street is beginning to suspect that A. F. of L. leaders are serving their own interests rather than those of the members. In other words, public opinion is definitely swinging against A. F. of L. leadership.

All of the foregoing means that the Wagner bill has no substantial support among employes, employers or the public. Its only advocates are A. F. of L. leaders, a few new dealers, several score of misguided congressmen and a small band of camp followers.

Should this small minority be permitted to substitute its will for the wishes of the great majority? We suggest that members of congress recheck the political strength of the proponents of this bill.

THE BUSINESS TREND



STEEL'S *index of activity in the iron, steel and metalworking industries gained* 1.7 *points to* 85.1 *in the week ending April* 13:

Week ending	1935	1934	1933	1932
Feb. 23	80.5	75.5	46.0	55.1
Mar. 2	81.1	78.8	47.4	54.1
Mar. 9	82.0	78.6	43.4	54.8
Mar 16	84.0	79.9	42.7	54.4
Mar. 23	84.0	79.7	44.6	53.5
Mar. 30	8.3	79.3	45.2	53.4
April 6	83.4†	79.6	49.1	52.6
April 13	85.1*	82.2	52.6	53.4

†Revised. *Preliminary.

The index charted above is based upon freight car loadings, electric power output, automobile assemblies (estimated by Cram's Reports) and the steelworks operating rate (estimated by STEEL). *Average for* 1926 *equals* 100, *weighted as follows: Steel rate* 40, *and car loadings power output and auto assemblies each* 20.

Outlook for Second Quarter Is More Favorable

BUSINESS sentiment again is improving slightly. This is due, first, to the ability of industry to hold its own against adverse political influences and, secondly, to the expectation that in the near future a portion of the government's unprecedented work relief appropriation will result in orders for the durable goods industries. In other words, the flow of business from more or less natural sources will be augmented in a few months by an increasing stream of bookings from Uncle Sam's artificial spring of work relief projects.

In recent weeks industrial activity—on the average—has been giving a fair account of itself even without the assistance of the five billion dollar fund. Three weeks of April have furnished some hints that forecasters, who six weeks ago were anticipating a rather sharp letdown in the second quarter, may be forced to revise their estimates upward.

For the first time in several weeks, in the week ending April 13 all four barometers which influence STEEL's index of industrial activity moved upward.

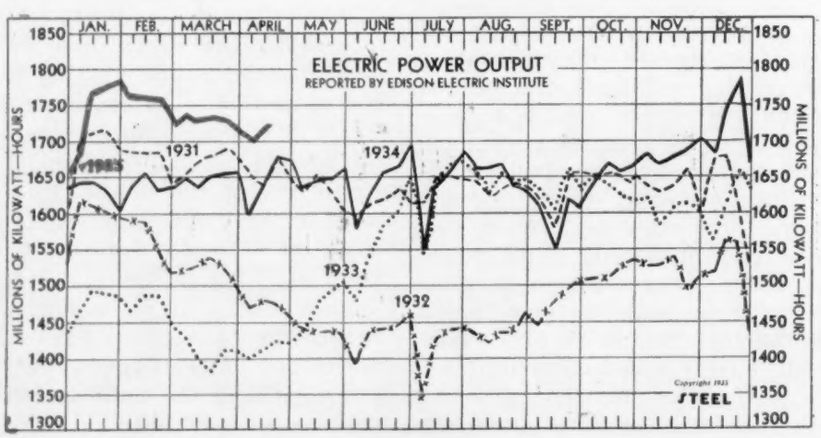
Revenue car loadings recovered sharply from the low mark of the preceding week. Electric power output mounted to 1,725,353,000 kilowatt hours. The rate of steelworks operations turned upward to 45 per cent, and automobile assemblies climbed from 107,895 to 109,337.

As a result of these concerted gains, STEEL's index touch 85.1, which establishes a new peak for the present cycle.

Million Kw.-Hours

1935

Apr. 13	1,725
Apr. 6	1,700
Mar. 30	1,712
Mar. 23	1,824
Mar. 16	1,728
Mar. 9	1,724
Mar. 2	1,734
Feb. 23	1,728
Feb. 16	1,760
Feb. 9	1,763
Feb. 2	1,762
Jan. 26	1,781
Jan. 19	1,778
Jan. 12	1,772
Jan. 5	1,668



Million Kw.-Hours

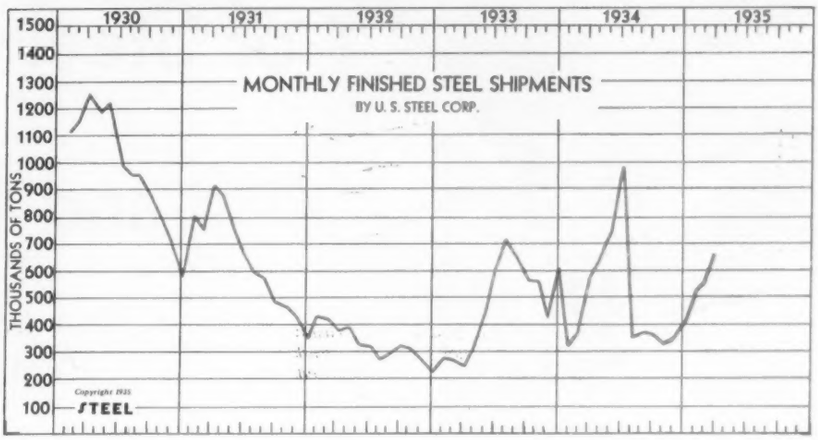
1934

Apr. 14	1,642
Apr. 7	1,616
Mar. 31	1,665
Mar. 24	1,658
Mar. 17	1,650
Mar. 10	1,647
Mar. 3	1,658
Feb. 24	1,646
Feb. 17	1,640
Feb. 10	1,651
Feb. 3	1,636
Jan. 27	1,610
Jan. 20	1,624
Jan. 13	1,646
Jan. 6	1,563

Finished Steel Shipments Continue Upward

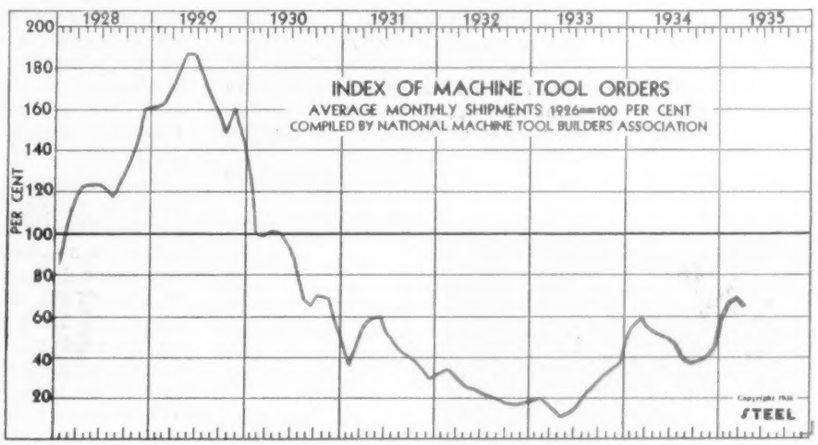
Gross Tons

	1935	1934	1933
Jan.	534,055	331,777	285,138
Feb.	583,137	385,500	275,929
March	668,056	588,209	256,793
April	.....	643,009	335,321
May	.....	745,063	455,302
June	.....	985,337	603,937
July	.....	369,938	701,322
Aug.	.....	378,023	668,155
Sept.	.....	370,306	575,161
Oct.	.....	343,962	572,897
Nov.	.....	366,119	430,358
Dec.	.....	418,630	600,639



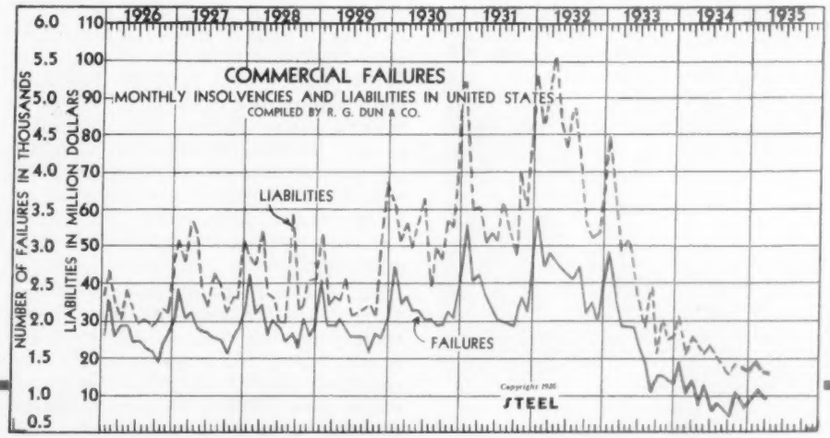
March Machine Tool Index Off Slightly

	1935	1934
Jan.	61.3	56.5
Feb.	61.5	58.2
March	60.3	50.9
April	.....	48.5
May	.....	46.8
June	.....	42.6
July	.....	38.6
Aug.	.....	37.1
Sept.	.....	37.4
Oct.	.....	40.5
Nov.	.....	44.2
Dec.	.....	54.1



	1933	1932
Jan.	18.3	32.8
Feb.	15.2	30.4
March	11.1	23.9
April	8.3	20.6
May	10.6	20.8
June	15.5	21.7
July	22.4	18.7
Aug.	27.9	16.8
Sept.	30.9	15.3
Oct.	33.3	15.7
Nov.	38.0	16.4
Dec.	51.0	17.6

Business Failures Continue at Low Ebb



	Failures		Liabilities	
	1935	1934	1935	1934
Jan.	1,184	1,364	$18,823,697	$32,905,428
Feb.	1,005	1,049	18,737,657	19,444,718
Mar.	976	1,102	18,522,840	25,786,975
Apr.	.....	1,052	.....	25,786,975
May	.....	977	.....	22,560,835
June	.....	1,033	.....	23,868,293
July	.....	912	.....	19,325,517
Aug.	.....	929	.....	18,459,903
Sept.	.....	790	.....	16,440,147
Oct.	.....	1,091	.....	19,968,448
Nov.	.....	923	.....	18,349,791
Dec.	.....	963	.....	19,910,610

Porch glider with frame of steel tubing and arms of reinforced sheet steel

Outdoor Furniture of Steel—Fabricating and Finishing

BY B. K. PRICE
Associate Editor, STEEL

GAY and attractive furniture has become a part of the present-day pattern of outdoor living. To appreciate this it is not necessary to conjure up visions of sweeping terraces and rambling verandas of large estates and country clubs; just travel through any well-ordered residential section in late spring and summer and you will see such furniture dotting porches and gardens with its added note of color and easy comfort.

The rigid, stiff backed chairs and "settees" are fast being relegated to the past and in their place may be seen low, soft cushioned chairs of rakish lines and pleasing appearance. The theory that most anything will serve for outdoor furniture because it is more or less exposed to the weather is now generally rejected and instead there is a growing appreciation that attractive furniture is as essential to the outward appearance of a home as a well-trimmed lawn, or a coat of fresh paint every so often.

Yet outdoor furniture by the very nature of its requirements is not a high priced line of household equipment. For it is true that it is subjected to varying conditions of weather and that, therefore, simplicity of design and assembly are essential; also, it is to be noted that standards for upholstery are on an entirely different basis than for room furniture —pleasing to the eye and comfortable, yet set with a view to practicability which precludes excessive cost.

Louvers in the side arms of gliders are formed in this press

It is into this growing field that steel in recent years has made important inroads—and, it might be added, it has more than paid its way. For not only has steel benefited from this new field, but the field itself has profited. Steel has added durability to the product, it has made possible certain sweeping changes in design and it has kept costs within range of the average purse.

Building Porch Gliders

A pioneer in this field, from point of steel, is the Bunting Glider Co., Philadelphia. It began with porch gliders as its principal product—and porch gliders are still its principal product—but it has steadily extended its line until it is one of the largest makers of this type of equipment in the country. Last year the Bunting company moved into a plant with over 200,000 square feet of floor space. Annual requirements of steel are substantial; during the rush season, from January to July, the company consumes close to 5000 tons and, in addition, several million feet of tubing.

In addition to gliders, the company's regular line includes stack tables, garden tables and folding stools. The company has recently obtained patents on a new type of stack chair. While its production is devoted largely to porch and out-

door furniture, it also manufactures certain types of metal furniture for indoors—for theater lounges, bars and restaurants; and it has taken heavy contracts in recent months for army cots. Work of this latter character contributes materially to operations during the so-called off months.

As may be assumed, requirements are confined to light steel—hot and cold rolled sheets, 18 to 20 gage; hot strip, 16 to 22 gage, and ranging in width from ⅛ to 9 inches; hard angles, ¾ to 2 inches; and high-carbon spring steel 5/16-inch thick and 1⅜ inches wide. Various types of wire are used, including spring wire for the helicals and larger coils, 9 to 11 gage; and basic wire used for lacing coil seats and coming in gages of 10, 10½, 11¼ and 14. The lighter gages of basic wire are also used for links. Also there is ¼-inch bright wire for S-hooks and certain other small parts. Approximately 1000 tons of wire are used during the busy season. Steel tubing required is ¾ to 1 inch in diameter.

Cold finished sheets—autobody sheets—are used for glider arms, table tops and for the seats and backs of chairs, and hot-rolled sheets generally for small tables, folding stools and for reinforcing gliders. Strip is purchased in both lengths and coils, principally hot rolled, for reinforcing purposes chiefly. The ⅛-inch width of hot strip mentioned above is for certain forms of reinforcing.

Angles for Framework

Angles, one of the largest steel items, are used for framework for the gliders and chair seats, and for table supports. Tubing is used extensively for end supports for gliders. About 2000 tons of angles are required annually for outdoor furniture alone.

In the construction of gliders, the principal product, there are approximately 15 different operations, depending upon the type of glider. The angles are fabricated to size and are welded. Sheets and strip come in for punching, trimming, mitering and right angle bending, with the company supplying many of its own dies. Included in this processing is the louvering operation, shown in an accompanying illustration. Sheets are assembled by spot welding.

Wire fabrication is done largely on three types of automatic machines. For certain forms used in the lacing, one type automatically measures off the wire, crimping it at certain points and cutting it into given lengths. Coiling is done automatically, one coil at a time; and another machine knots the coils. One of the coiling operations is shown in an accompanying illustration. After coiling and knotting, all spring wire is tempered for resilience in a gas oven, where it is heated for an hour at 600 degrees Fahr.

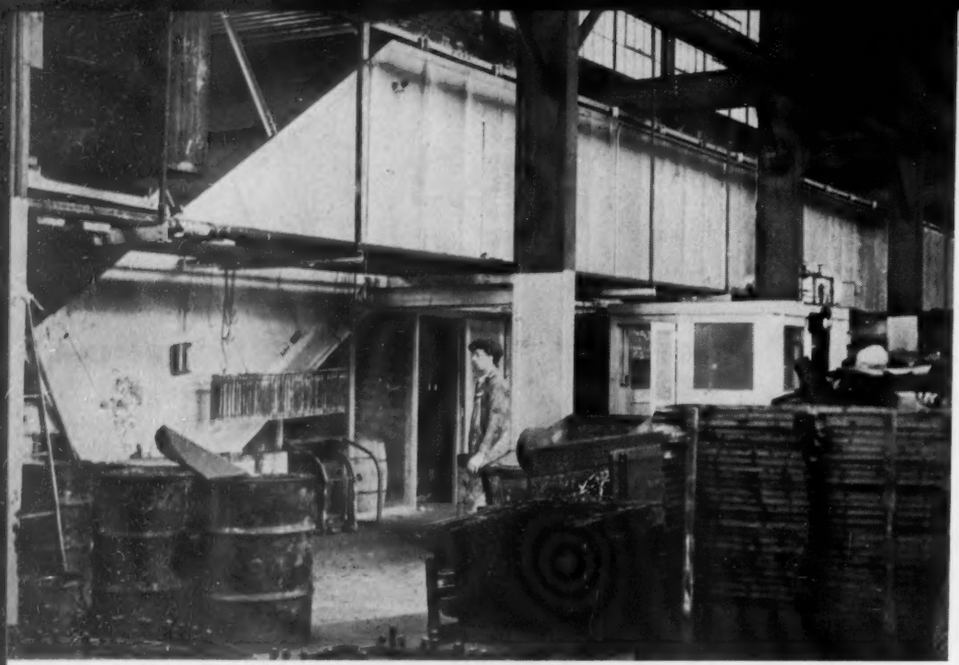
Spot welding strip member to a sheet in the assembly of glider arm

Tubing is formed on a machine especially designed by the Bunting company for lightweight and bedstead tubing. The machine has a large table, with the tube brought over a mandrel and automatically formed with the aid of a gyrating circular steel die. The machine is link driven and controlled by a clutch and brake. The principal forming operation is on glider ends. The tubing for these ends usually comes in specified lengths. For certain models, eight curves are formed in bringing the piece into desired shape, and when the operation is over the two ends are in position for butt welding.

While the forming and fabricating processes at the plant follow standard practice in the broad sense, the comany has supplied various innovations of its own. The tube forming operation is but one instance. Another is a device for cutting and punching narrow steel strips at one time. A punch press has been equipped for this operation. Another has been converted into a machine for forming small metal clips, and it is interesting to note that 20 tons of these small clips are turned out during the six-month rush period.

Still another punch press is performing a duty for which it was not originally intended. It is equipped with flat jaws for "slapping out" pillows; in other words, compressing

Stacking-type chair of steel tubing with perforated metal seat and back, finished in variety of colors



Section of the gas-fired main baking oven is shown in the background. Overhead arrangement is to prevent excessive escape of heat

the pillows into shape after they have been stuffed. Another small press has been converted to take S-hooks and hammer them into final shape after they have been roughly formed.

Another machine has been equipped with a special table on which several pieces of a section may be assembled and riveted at one stroke, and still another, a press, has been fitted with a special fixture designed by the company for breaking down the ends of sheets.

All welded joints are ground, and where tubing is to be chromium plated, it is first polished. Spring steel is cleaned by abrasive wheels to remove scale after tempering.

No closer attention is paid at any stage than to the final finishing operations. For not only does the ultimate appearance of the product depend much upon the exercise of care and correct processing at this point, but also the maximum resistance of the metal to corrosion. Good paints, good baking facilities and the proper application of both are essential.

Prior to the painting, the parts are degreased in a solution of alcoline and boiling water. They then go either to the spraying booths or to the dip tanks, the latter located at the entrance of the main baking ovens, which are 300 feet long and said to be the largest east of Detroit. A section of this unit is illustrated.

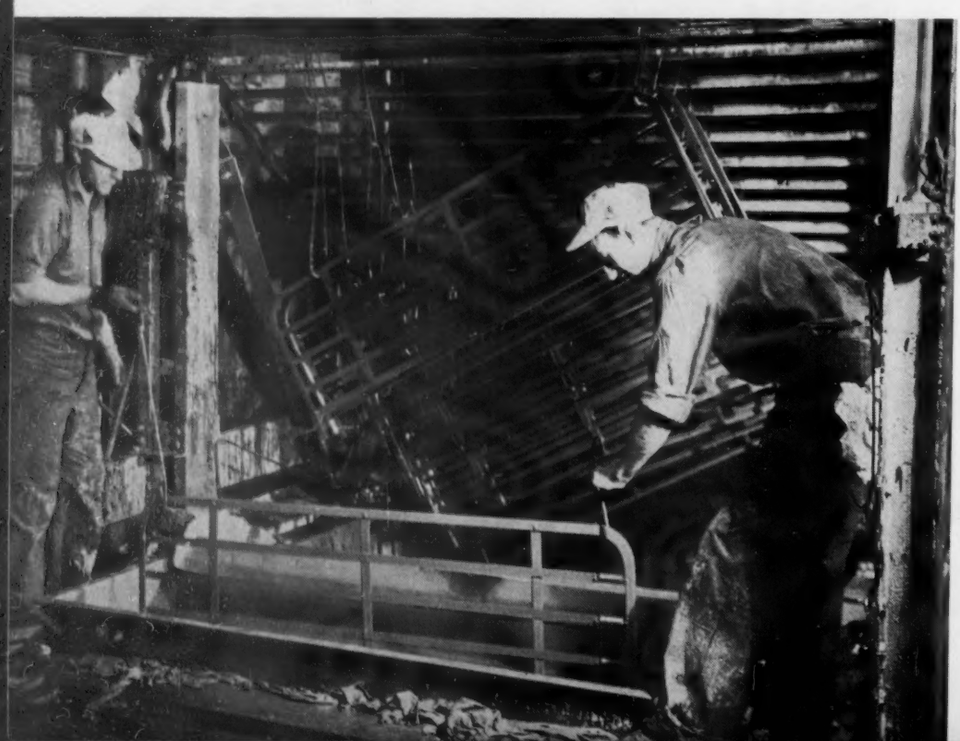
By far the greater number of parts are dipped after which they are hung on a conveyor system and carried through the ovens. They are transferred to another conveyor which carries them to the shipping department, where by that time they are sufficiently cooled for handling and wrapping. The parts are hung so that the ultimate drip on each piece will be confined to one point.

The conveyor moves at the rate of about 42 inches a minute, so that approximately 1 hour and 20 minutes is required for a part to pass through the baking ovens proper. The conveyor has a capacity for handling 180 bed springs and hour, or 180 pairs of glider arms, or 300 chair backs—to cite a few examples.

The layout of the dip tanks and continuous ovens is unusual. An electric agitator and six dip tanks of ¼-inch steel are set into the floor, the dip tanks having a capacity of 250 gallons each. The paint is first poured into the agitator and upon being properly mixed is automatically pumped into one of the various dip tanks.

When change in color is desired, the paint left in the tank to be filled is pumped out and the drain board washed. The drain board, incidentally, serves as a cover when the tank is not in use. About once every week, when the occasion permits, the agitator and all tanks are cleaned thoroughly and such "scrap" paint as accumulates is used for building maintenance—for the floors principally.

The baking oven is of special interest. Both ends of the unit are



Operators dipping and placing sections on conveyor for drying in the main baking oven. Parts are hung at an angle so that drip is concentrated at one point

open to allow for the free movement of the parts as they are carried through on the conveyor system. However, no heat escapes for the reason that the ends are substantially lower than the portion of the unit in which the gas burners—five in all—are located.

A large ventilator stack is necessary, with exhaust fans operating continuously, and if anything interferes with the operation of these fans the entire unit is shut down automatically. This arrangement is one of a number of safety precautions taken in the general operation of the unit.

The ovens themselves are on a level about 10 feet above the floor, and are accessible through any one of several doors, with the interior lighted. The ovens, when operating, are heated to a temperature of 300 to 400 degrees Fahr. and require about 30 minutes to reach the required temperature after they have been shut down for the night.

Spraying a glider arm in paint booth

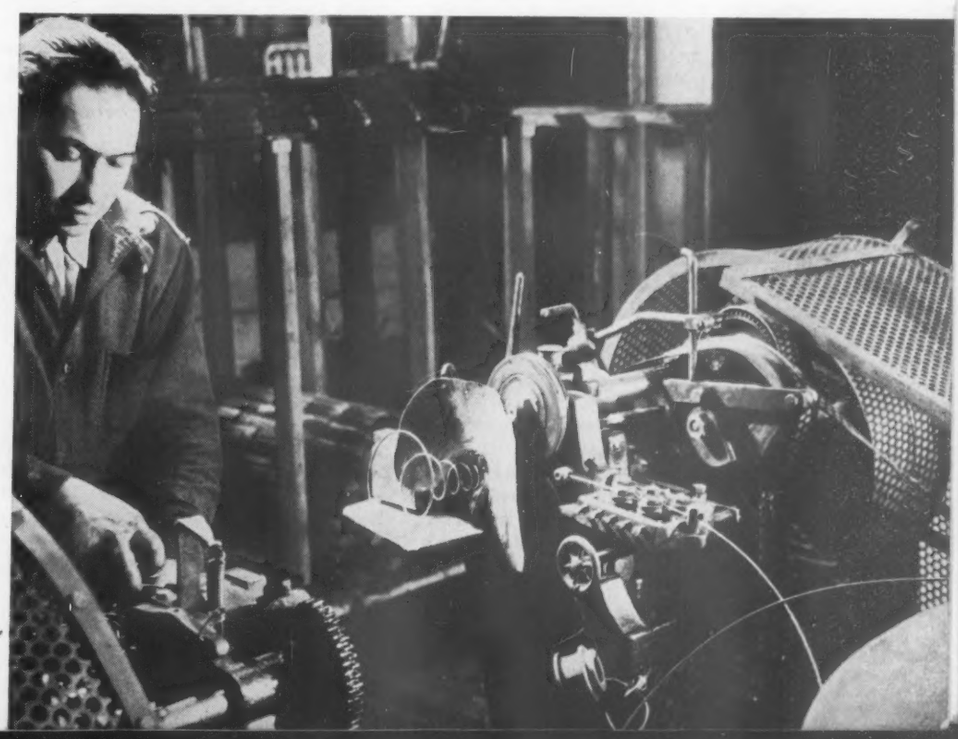
Steel Used as Framework For Copper Houses

Steel framework is to be employed as the skeleton in a new line of metal houses about to be introduced by Copper Houses Inc., subsidiary of Kennecott Copper Corp., 120 Broadway, New York. The first of these houses, for demonstration purposes, now is under construction in Washington. The exterior of this house will be of heavy copper wall sheets attached to the steel members by patented fasteners which provide for horizontal and vertical expansion and at the same time provide weatherproof joints. Inside walls are to be of plaster on metal lath, and the space between inside and outside walls is to be filled in with fireproof insulating material. Roof, leaders, gutters and down-spouts will be of copper, window frames of bronze and plumbing, hardware and lighting fixtures of brass or copper. The company will attempt to stimulate building not only in modern style but also in colonial and other conventional styles.

Bibliography Covers Wide Field of Inclusions

Bibliography of Nonmetallic Inclusions in Iron and Steel, cloth, 308 pages, 6 x 9 inches; published by mining and metallurgical advisory boards, Pittsburgh; supplied by STEEL, Cleveland, for $4, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

Technology department of the Carnegie library, Pittsburgh, prepared this bibliography as a publication of much interest and value in the whole field of ferrous metallurgy. It is arranged alphabetically by authors, containing 2136 items and many additional references to reprints, translations and abstracts. The brief annotations do not attempt to function as abstracts but are intended to aid the user to decide whether the original would be of use. A subject index contains 1338 entries, with reference, by number, to the author index.



Seat spring coiling machine, with operator at left knotting a coil on an adjacent machine

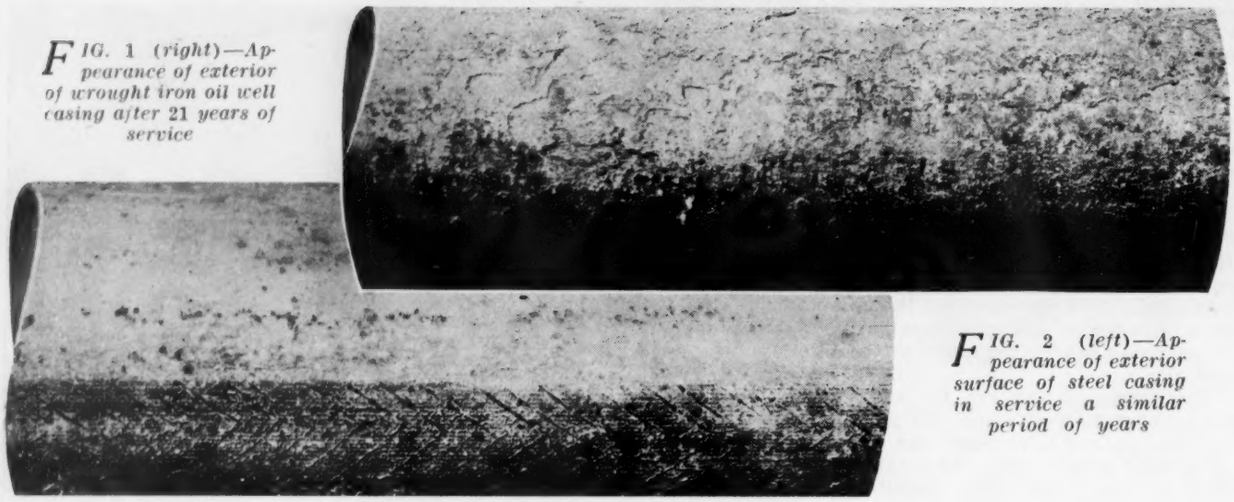


FIG. 1 (right)—Appearance of exterior of wrought iron oil well casing after 21 years of service

FIG. 2 (left)—Appearance of exterior surface of steel casing in service a similar period of years

Oil Well Casing of Bessemer Steel Shows Little Deterioration After 21 Years

BY G. A. REINHARDT
Director of Metallurgy and Research,
Youngstown Sheet & Tube Co., Youngstown, O.

ISOLATED cases of unusual resistance to corrosion frequently lead to the pitfall of unwarranted generalizations. For example, workmen dig up a pipe, part of a waterline which has served its purpose adequately for many years. A pipe manufacturer investigates, learns that the pipe has been in service a long time, that it was made by his company, and forthwith broadcasts the superior qualities of a product which has served faithfully over an exceedingly long period.

Such examples are too well known to need amplification, but those unfamiliar with the mass of this conflicting information need only review the trade literature.

Oil well casing, too, has had its share of widely advertised virtues illustrated by specific instances of long service life but utterly void of any data which permitted direct comparison with competitive products under anything like equal service conditions. To the uninitiated, the fact that one string of casing gave useful service for many years is proof positive that the manufacturer of that particular brand of casing had exercised good judgment in selection of material and finished the job in a workmanlike manner. However, the more one studies circumstances surrounding instances of uncommonly long service or occasionally the reverse, early failure, of oil well casing, the more he becomes certain that external influences, rather than inherent characteristics, are the controlling factors in service life of casing. True, on rare occasions, defective material or poor workmanship, in some unaccountable manner, escapes the vigilant eyes of a series of trained inspectors and sometimes casing fails in a relatively short time.

Soil Conditions Important

External influences are many and so varied as to preclude mention of all of them if, indeed, all were known. They include, however, chemical and physical nature of the strata penetrated and presence or absence of corrosive liquids and gases therein; chemical nature of the gases and liquids flowing through the casing; temperature of fluids in contact with the casing; methods and workmanship in handling, running and setting casing, including cementing; methods used in drilling and their results, and many others, each of which has a direct or indirect bearing on just how long any individual string or a group of strings of casing in the same field, penetrating the same formations will serve usefully.

All this is preliminary to the citation of the history of two oil strings, one steel, the other wrought iron, each of which was placed in service in the same year, in the same oil field, on the same lease, on the same farm, only a few hundred feet apart and set at the same depth. Both strings served satisfactorily for 21 years and due to depletion of oil both were pulled the same year for re-use in other wells. So far as can be determined the two strings were subjected to identical external influences, and in absence of contrary information, it is assumed they were identical at least to the extent possible under actual service conditions.

In late summer of 1934, attention was called to two strings of 6¼-inch 13-pound South Penn oil well casing, which had been in service since 1913 on a lease about a mile east of New Middletown, O. These strings had been in Hyland wells numbers 4 and 6.

One of these strings, recovered from well 4, was of Youngstown bessemer steel. This string showed practically no corrosion.

The other string, recovered from

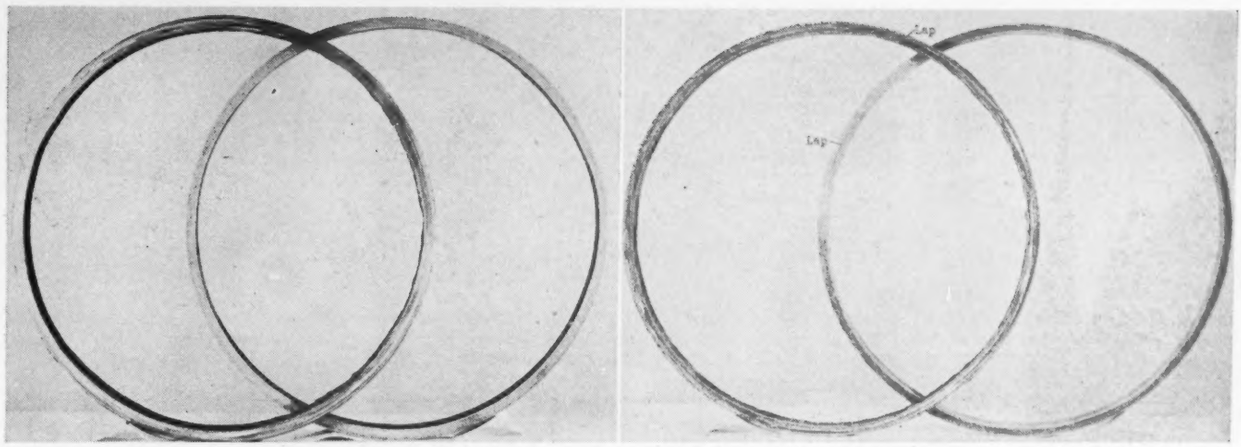


Fig. 3 (two at left)—Macroetched rings cut from wrought ir on and steel casings. Fig. 4 (two at right)—Deep etched rings cut from wrought iron and steel casings, respectively

well 6, located but a few hundred feet west of well 4, was of wrought iron. This string was considerably corroded and deeply pitted, externally.

The Youngstown Sheet & Tube Co. obtained one length of each type of casing, selecting it at random for further study. Figs. 1 and 2 illustrate the closeup appearance of both the casings.

Carefully prepared, representative samples from each analyzed as follows:

	Steel casing	Wrought iron casing
	——Per cent——	
Carbon	0.06	0.03
Manganese	0.48	0.15
Sulphur	0.061	0.131
Phosphorus	0.109	0.145
Silicon	0.009	0.15
Copper	None	0.09

Each analysis is typical of good quality, the one of bessemer steel, the other of wrought iron casing, and fails to offer any solution as to the difference in their relative rates of corrosion.

Tests were made to determine the strength, elastic properties, ductility and hardness with the following results:

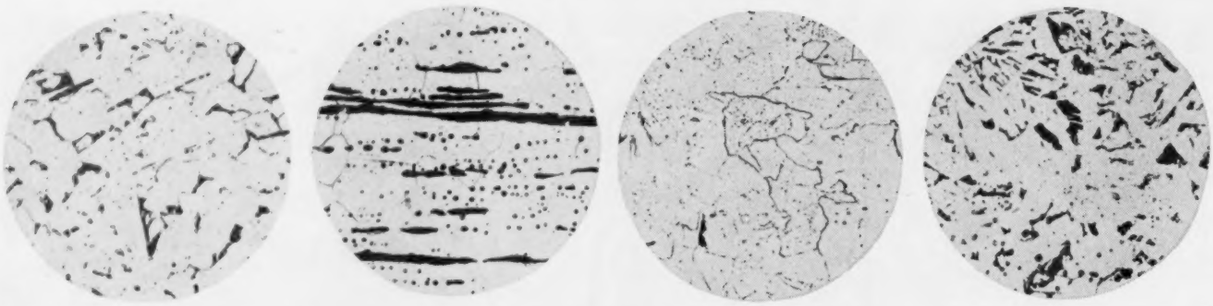
	Steel casing	Wrought iron casing
Ultimate tensile strength, lbs./sq. in.	58,715	43,060
Yield point, lbs./sq. in.	38,035	28,625
Elongation in 8 ins., per cent	25.3	15.0
Reduction in area, per cent	43.3	31.4
Rockwell B hardness	66	52

The above physical properties conform in all respects with present standard specifications for bessemer steel casing and wrought iron casing, respectively, although manufactured years before such specifications had been formulated.

Two rings ½-inch in length were cut from each casing. Fig. 3 illustrates the condition of each, wrought iron and steel, after etching for macroexamination, that is, etching in dilute acid sufficiently to reveal the structure to the naked eye. The ring on the left is wrought iron, while the one on the right is steel. It will be noted the wrought iron consists of distinct layers of metal, showing its heterogeneous make-up, while the steel, etched under identical conditions, shows a homogeneous structure. These differences are even more apparent in Fig. 4, which shows the rings after deep etching. It will be noted the length of the "lap" (or overlapping of the welded edges) of the wrought iron is only about one-third the length of lap of the steel casing. Other conditions equal, the longer lap is stronger.

Figs. 5 to 11 inclusive are photomicrographs at 100 diameters magnification. Fig. 5 is a photomicrograph of a transverse section of the steel casing in the unetched condition, showing freedom from corrosion at the surface. Figs. 6 and 7 are photomicrographs of transverse sections of the wrought iron casing showing deep pitting penetrating the outer layers of iron. Fig. 8 is a photomicrograph of an etched specimen of the steel casing. This structure is typical and is uniform throughout the wall thickness. Figs. 9, 10, and 11 are photomicrographs of the etched wrought iron and show variation in structure and composition of the different layers of which

Fig. 5 (left)—Transverse section of steel casing at outer surface, unetched. Figs. 6 and 7 (center and right)—Transverse sections of wrought iron casing, unetched. X100



Figs. 8, 9, 10 and 11 (left to right)—Transverse section of steel casing, etched. Longitudinal section of iron casing, area rich in slag, etched. Transverse section of iron casing, area free from slag and carbon, etched. Transverse section of iron casing, area rich in carbon and free from slag, etched. X100

it is composed. Fig. 8 confirms the appearance of the macroetched ring of steel illustrated in Fig. 3, as well as the deeply etched specimen in Fig. 4. The photomicrographs of the wrought iron explain the irregular or heterogeneous appearance of the macroetched ring of wrought iron shown in Fig. 3 and the deeply etched ring in Fig. 4.

Rings, about 1 inch in length, were cut from each casing for measurement of wall thickness. The average thickness of the original wrought iron casing was 0.216-inch which is 22 per cent heavier than the steel casing which had retained its original wall thickness, averaging 0.177-inch. Although the wrought iron casing had a much heavier original wall than the steel casing, corrosion had pitted it to a depth of 0.065-inch, causing a loss of 30 per cent in effective wall thickness, leaving a wall of only 0.151-inch at some places, whereas the steel casing retained its original thickness as noted above.

Galvanic Action Involved

As earlier stated, soil and rock conditions, particularly the chemical nature of the liquids therein, have a direct bearing upon the life of casing.

It is, of course, a well established fact that when dissimilar metals are in contact and submerged in an electrolyte, an electric current is produced, resulting in corrosion. This is spoken of as galvanic action. In the case of the wrought iron under consideration, because of its heterogeneous structure, galvanic action was evidently set up by contact of wrought iron casing with ground waters containing mineral salts in solution. Because of its uniform structure and composition, the steel did not set up galvanic action under the same conditions of service as the wrought iron.

The steel casing recovered from these wells, after 21 years of service, was sold to a pipe supply company for further use.

As earlier stated, the above instance should not be interpreted as representative under all conditions, as both types of metal have their uses. On the other hand, the geologic structure in the wells from which the above pipe was removed are no doubt reasonably representative of the average of such structures in many parts of the country.

New Monel Metal Alloy on Market

A NEW corrosion-resistant, nonferrous alloy has been developed by the International Nickel Co. Inc., 67 Wall street, New York, by adding a small amount of aluminum to monel metal. Known as K monel, the new alloy is the result of 12 years of mill and laboratory study. An interesting and important advantage claimed for the metal is that it may be hardened by heat treatment.

The alloy is said to retain the corrosion resistance of monel metal and has the added advantage of increased strength and hardness following heat treatment. Soft K monel has a hardness around 140 to 150 brinell, which may be increased to 300 or higher by heat treatment. The new metal is claimed to offer the designing engineer an engineering metal with strength ordinarily found only in heat treated alloy steels and not offered by other corrosion resistant alloys available at moderate prices.

Analyses and Properties

Analysis of K monel is 63 per cent minimum nickel, 25 per cent minimum copper, 5 per cent maximum aluminum, 0.20 per cent maximum carbon, and 5 per cent maximum other metals. An analysis typical of present production might show 63.32 nickel, 30.84 copper, 3.45 aluminum, 1.50 iron; 0.50 manganese, 0.16 carbon, 0.20 silicon, and 0.005 per cent sulphur. Density of the new metal is 8.58, its melting point between 2400 and 2460 degrees Fahr., and its weight 0.31-pound per cubic inch. Its electrical resistivity at 0 degrees Cent. varies from 61.9 to 62.8 microhms per cubic centimeter. It is nonmagnetic under ordinary working conditions.

In its hardest grade, K monel is said to have a proportional limit in excess of 100,000 pounds per square inch, tensile strength in excess of 160,000 pounds per square inch, with elongation in excess of 15 per cent in 2 inches. Tempered to lower hardness, the ductility is greater and the strength less. K monel wire has been drawn and heat treated to 175,000 to 200,000 pounds per square inch tensile. This wire retains its properties at temperatures up to 400 degrees Fahr. The endurance limit of K monel under noncorrosive conditions is lower than found in most carbon and alloy steels, but compares more favorably with that of steel where corrosion is involved. Impact of K monel decreases with increasing hardness.

Torch welding is not applicable to K monel because of sluggishness due to aluminum oxide. Electric arc welding can be performed by using a K monel welding rod coated with a mixture of 90 per cent cryolite and 10 per cent wheat flour, with a minute quantity of asbestos for mechanical binding. It can be brazed with suitable solder and flux. Complete data in regard to hot and cold working, heat treatment, pickling and machining of the new metal are set forth in Bulletin T-9 prepared by the development and research department of International Nickel Co.

Use of Dissimilar Metals In Canning Causes Pitting

Considerable difficulty recently was encountered by a manufacturer of canning machinery due to pitting of the metals exposed to the canning liquid. It was found that this pitting resulted from the fact that various dissimilar metals, carbon steel, stainless steel, bronze, cast iron and copper were used alongside each other causing the formation of electrolytic couples. The trouble was cleared up after the manufacturer changed his designs and constructed all of the exposed parts of stainless steel.

Conveyor screw easily welded

Licensed under Chemical Foundation Patents Nos. 1316817 and 1339378.

it's Stainless, too...

Link-Belt Co., Chicago, recently produced a conveyor screw that is a gleaming tribute to the weldability of Republic ENDURO Stainless Steel. This particular screw, a section of which is illustrated here, was made for a food conveyor, but the same type is equally adaptable to the handling of chemicals too corrosive to be conveyed by ordinary steel.

Because of its high resistance to corrosion—because it is long lasting and economical—because it fabricates easily and is available in many forms—Republic ENDURO is rapidly becoming the favorite metal for food and chemical equipment.

Investigate the savings it will make possible in your plant. Write for information and outline your requirements. Our research staff has a wealth of data that is yours for the asking.

Republic Steel
CORPORATION
GENERAL OFFICES · · · YOUNGSTOWN, OHIO
CENTRAL ALLOY DIVISION · · MASSILLON, OHIO

REPUBLIC STEEL

METHODS AND MATERIALS

Corrosion Set Up By Mill Scale

THAT dissimilar metals in contact greatly accelerate rates of corrosion resulting in localized attack of the baser metal, is fairly well known. For instance, when copper and steel are in contact the steel will be aggressively corroded with practically no loss of copper. The rate of the attack will depend on the hydrogen-ion concentration of the electrolyte (the solution in contact with the metals), the dissolved oxygen present, and other factors.

In presenting the Edgar Marburg lecture on "Water as an Engineering and Industrial Material" before the annual meeting of the American Society for Testing Materials in 1934, S. T. Powell, consulting chemical engineer, Baltimore, discussed the corrosion of iron and steel in steam generating stations and made special reference to the effect of mill scale.

Since the composition of mill scale is different from that of steel and iron, mill scale in contact with ferrous metal frequently sets up localized corrosion, stated Mr. Powell. Mill scale probably is responsible for greater localized corrosion than is experienced generally from other dissimilar metals in contact. Mill scale, which consists largely of magnetic iron oxides, is not readily attacked, and when it covers the entire surface serves as an excellent protection.

The difficulty arising from mill scale is from patches of scale in contact with areas of steel not so protected. Actualy what happens, explained the speaker, is that the two materials are in electrical contact, and in the presence of an electrolyte an electric circuit is completed. When this occurs, the nobler metal, namely, the mill scale, becomes cathodic while the steel becames anodic. When such a condition is set up, the mill scale or cathodic pole is protected, since it is plated with atomic hydrogen, while the other metal, in this case the steel, passes into solution. When such action takes place in boilers for appurtenant equipment, the iron or steel is aggressively attacked in the form of pitting, the corrosion taking place in exposed spots between the mill scale.

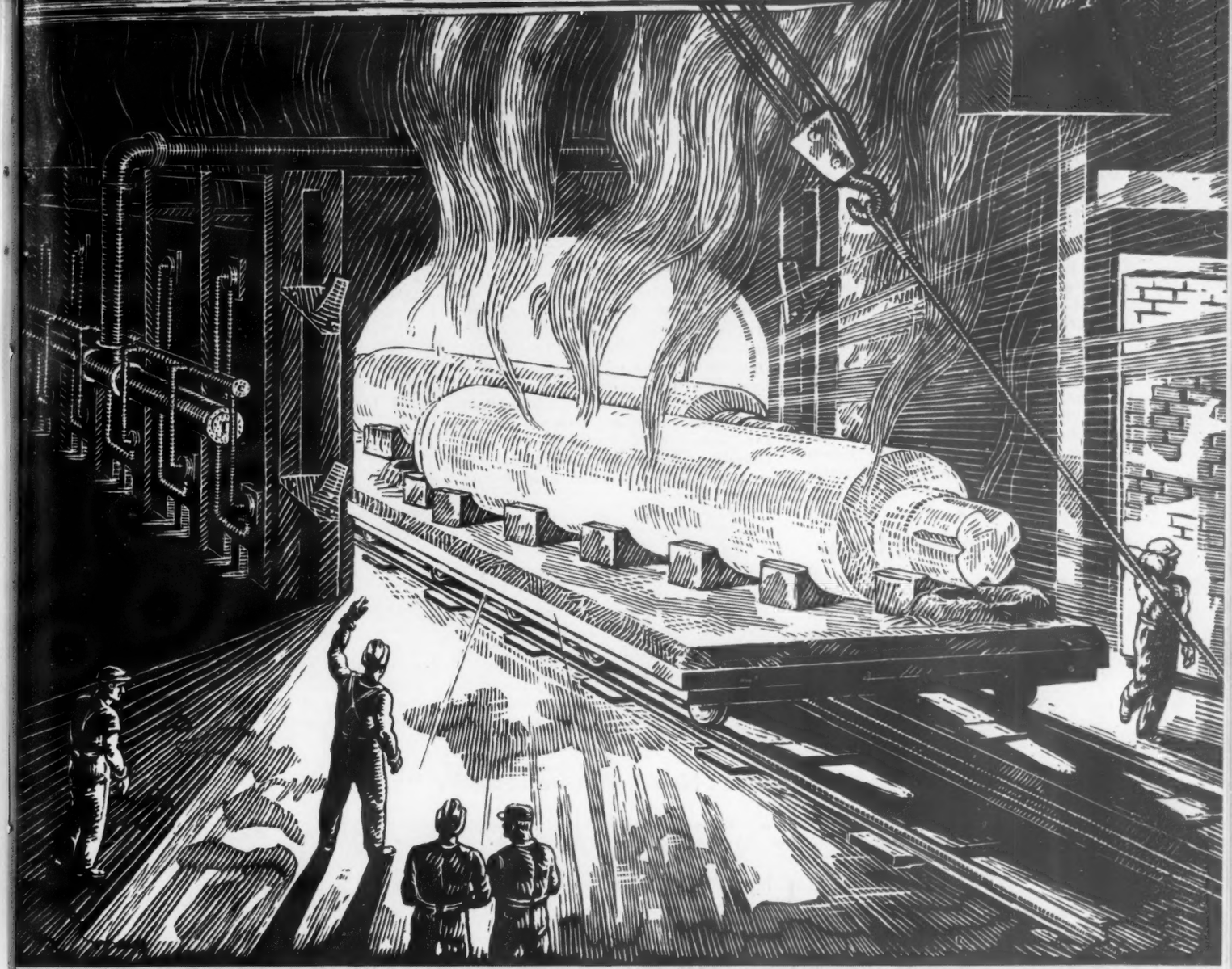
To avoid this form of corrosion,

Unusual Use for Roller Bearings

ROLLER BEARINGS CUT FRICTION LOSSES IN LIFTING 544-FOOT, 4,160,000-POUND, MOVABLE SPAN OF NEW CAPE COD CANAL RAILROAD BRIDGE: The span is raised by 40 2¾-inch steel cables at each end which pass over four 10-groove sheaves and down to a 1000-ton, steel-encased, concrete counterweight. Shown in illustration is one of 16 4½-ton roller bearing pillow blocks, built by Bantam Roller Bearing Co., South Bend, Ind., for supporting the eight rope sheaves. The roller bearings themselves are of the self-aligning, straight roller type, with roller thrust bearings of the self-aligning type built into the bearing end caps to take any thrust loads which may be encountered. Total radial load on each roller averages a little less than 600,000 pounds. Power units for raising the movable span are two 150-horsepower electric motors, one at each end

Wanted: Galvanizing Expert

"Wire us collect," flashes one of STEEL'S readers, "the names and addresses of at least five consulting engineers able to design and lay out operation of hot dip galvanizing equipment."



MODERN ROLL TECHNIQUE

Pittsburgh Rolls Corporation manufactures rolls exclusively. They have no other main lines, side lines or divergent interests. All research, engineering and production facilities of the company are engaged every moment of the day in the manufacture of better rolls and in future planning for still further betterment.

The interests of the rolling mill industry are best served by such intensive specialization.

PHOENIX ROLLS

PHOENIX STEEL, for unusual strength; PHOENIX "A" (steel alloy), for strength and wear; PHOENIX METAL—PHOENIX "K", for strength, wear and finish; PHOENIXLOY (uniformly hard), for flat rolling where high finish of extremely thin gauge of material is required to be free from all marks or defects. Also tube mill rolls of quality material best suited to the kind of service required; PHOENIX CHILL; PHOENIX NICKEL CHILL, for all flat rolling requiring finish.

PITTSBURGH ROLLS CORPORATION

PITTSBURGH, PA.

mill scale should be removed prior to putting the equipment in service. Removal of mill scale can be effected by pickling with acid or by mechanical means such as sand blasting. In recent years, the process of removing mill scale by acid has been improved by the use of inhibitors.

In view of the marked influence of mill scale as a factor in corrosion, it is surprising that more attention is not given to the preparation of the surfaces of metal in boilers and appurtenant equipment where the metal is in contact with electrolytes (water) containing salts in solution having high electric conductance. Mr. Powell declared that more attention to this particular phase of corrosion activity would greatly lessen corrosion problems in steam generating stations.

$ $ $

Consider Rebuilding Bridge Floors of Stainless Steel

In view of the fact that some of the older bridges in New York are beginning to show signs of age, attention is being given to the problem of rehabilitating them and lessening the strain on them.

One plan, now actively being considered, calls for lessening the weight on the superstructures by rebuilding the floors with stainless steel. By this plan, the floors would be of stainless steel floor plate, resting on structural members fabricated from stainless steel strip by methods similar to those used in the construction of the strength members of light weight stainless steel trains and airplanes. The fact that the use of stainless would reduce maintenance by removing the necessity for much of the present painting also is a factor.

$ $ $

Wanted: Polishing Material That Will Not Pick Up

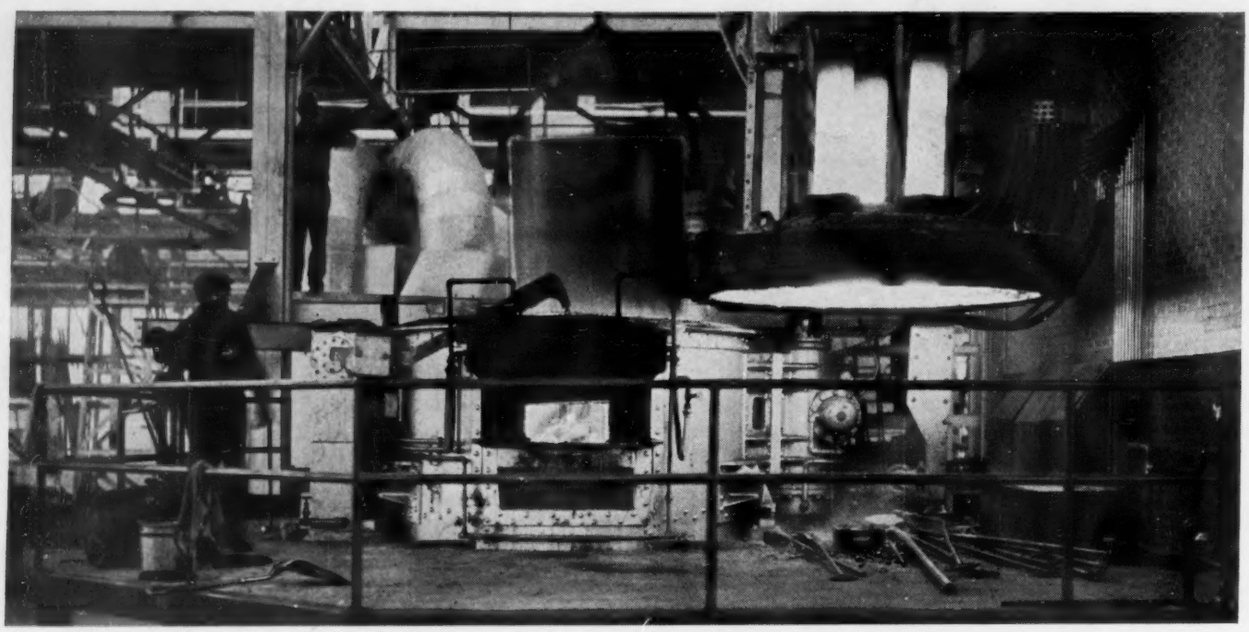
"In polishing cold drawn or ground bars by spinning them at a high number of revolutions between two disks," writes a reader of STEEL, "we found that solid disks picked up from the bars and thereby ruined the finish of the bars to be polished. By changing to chilled gray iron disks the pick-up on the disk was eliminated but after a day's run the surface of the chilled cast iron disk had become porous. Can you suggest a material for these disks which will not pick up and at the same time can be polished smooth with a very close grain and which will have Shore hardness of 70 to 90?"

Special Stops and Spacers Control Width of Flanges

An interesting device has been worked out in a Middle Western sheet stamping and forming plant to speed up the operation of a press brake with V-shaped die. This machine is used to bend right-angled flanges on the sides of sheets, and the distance between the male and female portions of the die is adjusted in accordance with the gage of the sheets being bent. The flanges range in width from 3/16-inch to 4 inches, and considerable delay was encountered in setting the back gage that came as regular equipment on this machine.

The metalworking company solved this problem by drilling holes through the female or bottom V die and attaching stops by means of bolts passing through these holes. Between the stops and the die are spacers which regulate the width of the

Canada's New Electric Steel Foundry



ELECTRIC FOUNDRY IN CANADA CASTS ALLOY STEEL CRANKSHAFTS: This new $425,000 unit of Ford Motor Co. of Canada Ltd., East Windsor, Ont., was formally opened March 29 when the Border Cities branch of the Engineering Institute of Canada held its monthly meeting there. John S. Beaumont, the company's chief chemist, read a paper on the alloy steel used. It contains 1.35 to 1.60 carbon, 0.50 to 0.60 manganese, 0.85 to 1.10 silicon, 0.40 to 0.50 chromium, 1.50 to 2 copper, 0.10 maximum phosphorus and 0.06 maximum sulphur. The melting unit is a 5-ton electric furnace, charge consisting of 40 per cent steel scrap and the remainder pig iron, back stock and alloys. Five heats a day are being produced, with an output of 460 to 475 crankshafts per day; on a 24-hour day schedule, this output could be increased to over 1200. After removal of gates and risers, the castings are heat treated in a 62-foot, continuous, automatically-controlled furnace. Special, hammered, high-speed steel cutting tools are employed; the cutting tools are fed into the work as heavily as possible due to the fact that a light feed causes the tools to glaze quickly and dull. The electric furnace installation is completely automatic; it utilizes 10-inch electrodes and pulls 2400-kilovolt-amperes from the Ford power house

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● It is unique in the industry, we believe, the Acme service on Superstrip.

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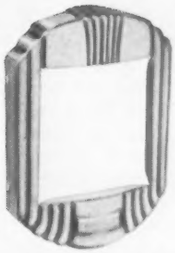
There's no magic about it — simply skill, experience, equipment, and hard, painstaking work.

The result to manufacturers is—reduced waste and rejections, speeded production, economy, and a finer product.

There is lots of good strip steel, but only one Superstrip. It costs no more. It's worth checking into. Send the coupon for the new booklet, "Batting 'Em Out"—telling of many products "made better" with Acme Superstrip. ACME STEEL COMPANY, 2826 Archer Avenue, Chicago. *Branches and Sales Offices in Principal Cities.*

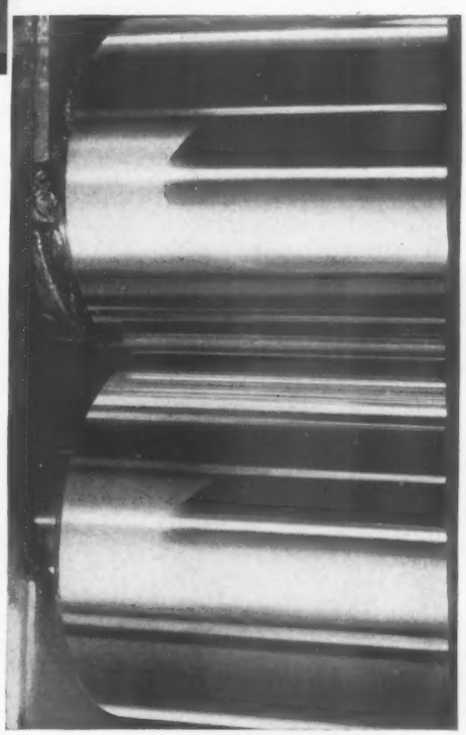
Acme Superstrip

HOT ROLLED • COLD ROLLED — The ACME of STRIP STEELS — GALVANIZED • STAINLESS



● Automobile heater shell, made from cold rolled No. 3 finish Acme Superstrip, for chrome or nickel plating. Not only is an exceptional finish required for this job, but the quality of the steel must permit particularly severe drawing for the formation of the ribs.

● Mirror-like rolls give Acme cold rolled Superstrip a mirror-like finish.



ACME STEEL COMPANY,
2826 Archer Avenue, Chicago
Send me your new booklet, "Batting 'Em Out."

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flange. These have been machined to micrometer accuracy, and a set of them has been provided for each desired width of flange. Use of such spacers and stops not only has cut the time of setting the machine up for accurate flanging, but has increased its capacity, since it is possible to set up on one side for one flange and on the other side for another flange.

Thus, a sheet taking a 3/16-inch flange on one side and ½-inch flanges on the other sides, can be flanged all around in one setting of the press brake.

Incidentally, on account of the allowance which has to be made for the width of the V die, each spacer is ⅜-inch shorter than the flange width which results from its use. For this reason, no spacer is used when making a 3/16-inch flange; instead a stop with an overhang of 3/16-inch over the V die is employed.

Installs New Equipment for Heat Treating Springs

TO IMPROVE its facilities for heat treating springs and stampings, the Duer Spring & Mfg. Co., McKees Rocks, Pa., has installed new furnace and quenching equipment which includes a continuous gas-fired hardening furnace, a water-cooled oil quench tank and a rotary gas-fired drawing furnace. The product which can be handled by this equipment includes small steel stampings and helical springs ranging from those made from light wire sections to those made from 1-inch bars with diameters up to 7 inches and lengths up to 27 inches.

The hardening furnace is shown at the left in the accompanying illustration, with the floor-level quench tank at the extreme left; the rotary drawing furnace is shown at the right. Designed and built by Pennsylvania Industrial Engineers, Pittsburgh, the hardening furnace has a hearth approximately 28 inches wide and 8 feet long. Lining of the furnace is insulating refractory brick throughout.

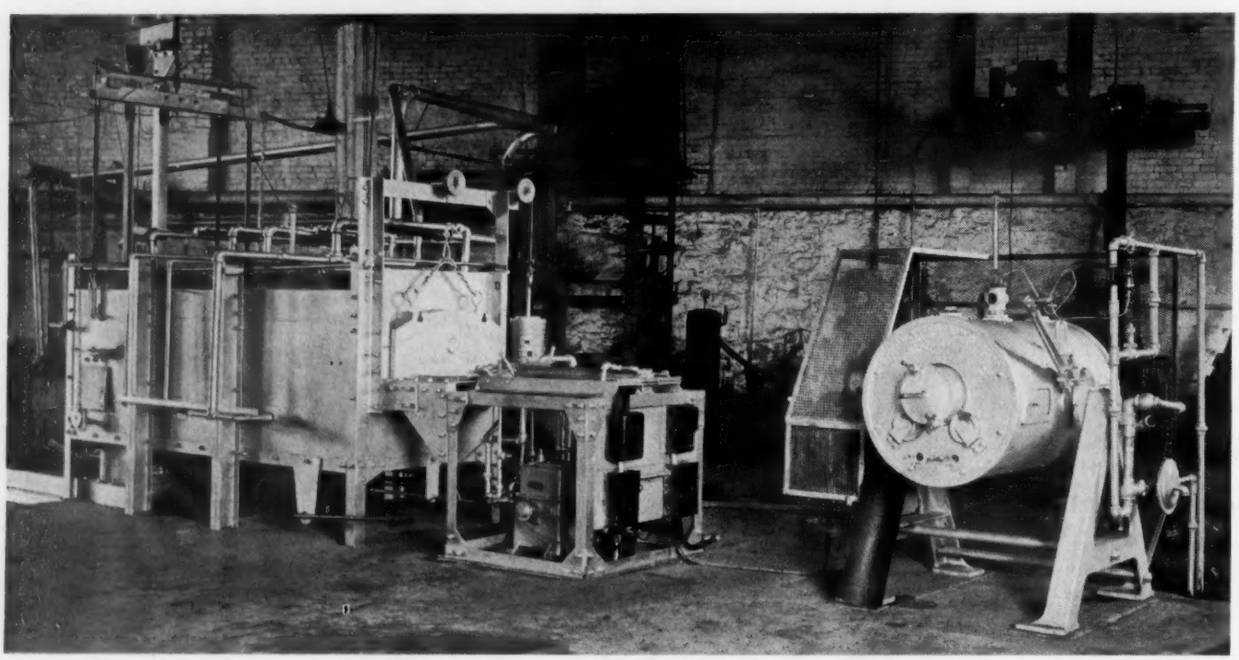
Springs to be hardened are threaded on small alloy rods which are placed on alloy trays of a skeleton type or are laid on an alloy wire mesh placed on the bottoms of the trays to form a floor, the method of handling being dependent upon the size and weight of the material to be treated. Loaded trays are placed on a charging platform at the right end of the furnace.

The operator opens the furnace door with a foot treadle and when he pushes forward on a control lever, the tray on the charging platform moves into the heating chamber. Trays inside the furnace all advance one position and the tray farthest advanced moves onto an elevator. As soon as the forward motion stops, the elevator moves downward through a sealed chute into the quenching oil. When the elevator has reached its bottom position, a pusher operating in the quench tank pushes the tray from the elevator platform into a conveyor which advances all the trays in the tank one position, exposing the last tray so that it may be removed to the drawing furnace.

Oil Circulated, Cooled

A turbine pump is utilized to circulate the quenching oil and the temperature of the oil is controlled by passing water through coils in two of the tank's sidewalls. All movements of material through the furnace and quench tank are obtained through oil hydraulic cylinders operated by a pump. The cylinders are interconnected with mechanical linkage so that the operator has only to start the cycle and it is completed automatically, after which the mechanism is reset for the next cycle. The length of cycles is controlled electrically.

The hardening furnace is fired with natural gas by means of low-pressure proportional mixers through special nozzles which fire both above and below the trays. Special burner equipment also is provided over the elevator shaft to provide a uniform soaking for the springs about to be



A Pennsylvania manufacturer of springs and light stampings has modernized its heat treating operations with the installation of this equipment, which includes a continuous hardening furnace (left), a floor-level quench tank (extreme left), and a rotary drawing furnace (right). Both furnaces are gas fired

quenched. The temperature in the furnace is controlled in two zones, a recording-type controller operating in conjunction with a control valve.

After the springs have been removed from the oil quench, they are taken from the trays and charged into the drawing furnace, which is a standard rotary retort batch-type heating furnace built by the American Gas Furnace Co., Elizabeth, N. J. It consists of a revolving retort within a refractory chamber, all of which is self-contained in a steel shell. The retort has an individual motor drive.

The head of the retort swings open to receive a charge of springs. With the retort revolving, heat is distributed uniformly through all parts of the charge. The retort is externally fired with natural gas by means of a low pressure proportional mixer firing through a large number of small tips well distributed beneath the retort. Temperature is controlled automatically by means of a control valve of the throttling type operating on the air line and registering on a central control unit.

Importers and Exporters Given Much Information

1935 *Custom House Guide*, cloth, 1500 pages, 6 x 9 inches; supplied by STEEL, Cleveland, for $10, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminister, London.

Following successive issues since 1862 under various names the 1935 volume is greatly enlarged and its information amplified. In it are presented new sections including the Cuban reciprocal trade agreement, the reciprocal tariff bill, revenue act of 1934, the anti-dumping act and others.

The alphabetical commodity index has been completely revised and shows new rates of duty covered by the President's proclamations and trade agreements, new classification numbers and units of quantity as provided for in regulations of import schedule A.

To those engaged in foreign trade this volume provides a wealth of information of great value.

Stainless Steel Considered For Water Filtration Parts

The public works department, water division, Boston, is working on plans to utilize stainless steel of the chromium-nickel or straight chromium types in the construction of mechanism exposed to the water in its filtration stations, thus providing a solution of the problem of rust resistance.

Actions and Reactions

IN THE WELDING FIELD

BY ROBERT E. KINKEAD

Rare

A CLIENT of ours is a gentleman. To the best of our knowledge, he never deliberately hurt another man's feelings or depreciated his self esteem. All the niceties of courtesy and politeness seem to be second nature to him. Many who meet him only casually underestimate his abilities because he is a gentleman.

But this man is doing, successfully, one of the most difficult jobs any industrial executive was ever called on to do. He has carried out a policy over a period of years and made it work. When men have failed he has substituted others who were more competent. He has rewarded successful performance. The fact he is still a gentleman leads people to error in appraising him. It is one thing to call a man a blackhard so-and-so and order him off the property; it is something else to have the desire but to refrain from doing so. Such restraint takes it out of a man. The fact he can take his emotional explosions out behind the barn when they are ready to detonate is a virtue, not a weakness.

Not being a gentleman, we take this opportunity of expressing our admiration for one.

IN THIS column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

Trial and Error

We were recently trying to get one man to operate two welding arcs. The special equipment cost about $25. The scheme worked. Evolution from that point to commercial application will be based on trial and error methods.

Nature solves all of her problems with plant and animal life by trial and error. A man may experiment a little with his own life; nature operates in terms of thousands of generations—and gets the answer every time. Man gets into trouble when he experiments with the lives of others. Government fails when it governs too much. Industrial enterprise fails when it tries to control too many people. Money lenders are ruined by inflation when they get too many people into too much debt. Natural law, not the Constitution, limits the power of one man over many.

Those who can make their peace with nature, that is, with reality, can have a grand time in this world. Others run around getting hurt. There is a lot of sport in trying new ideas, provided failure does not mean you become deranged, broke, or get killed.

Human Factor in Welding

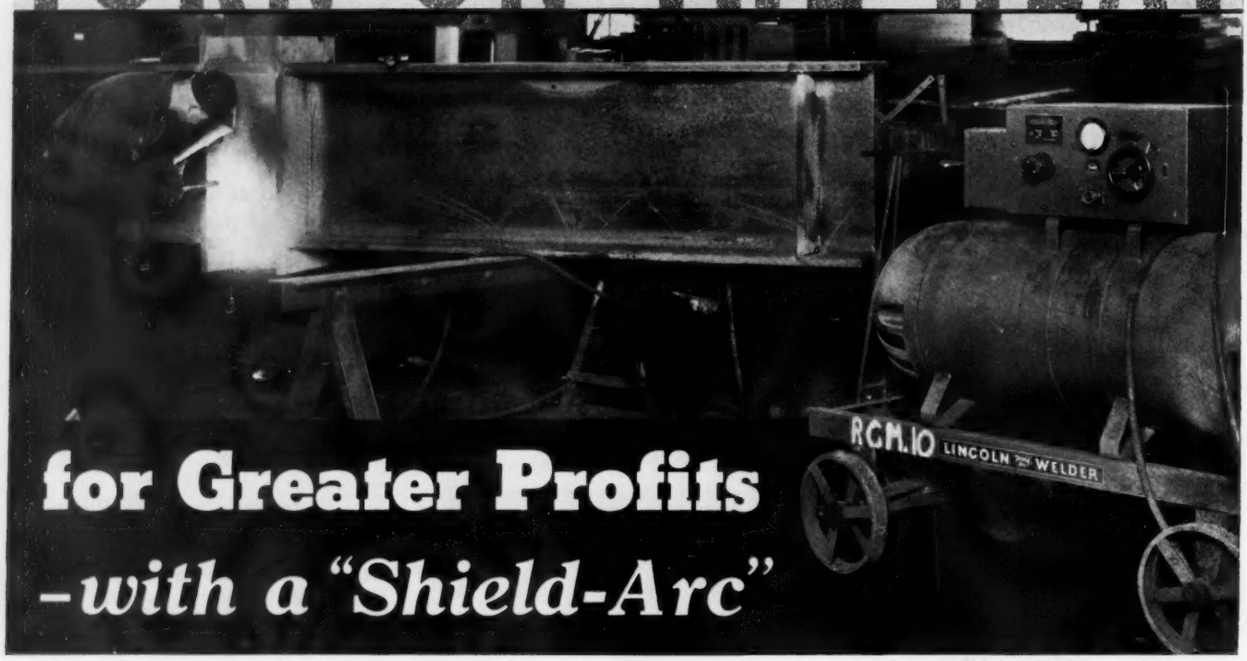
Welding equipment is sold by people. They may be overenthusiastic. Welding shops are managed by people. Such management is often pretty dumb. Welding operations are performed by craftsmen. Craftsmen do not all have the same skill. The human factor in welding is the most important factor. The human factor is the most important factor in every industrial process from accounting to selling scrap. But the human factor is of no greater consequence in welding than in foundry or machine shop work.

Management can and does control the human factor in exactly the same manner in welding as in other processes. Many miles of welding are accomplished every day in this country and the failures are surprisingly few. The better the management the fewer the failures.

Try to get a drink of water around a first class hotel lobby now. We haven't the courage to ask a bartender for a drink of water and cannot stand beer during the day. Repeal is forcing us to carry a hip flask—filled with water.

You Can

TURN ON THE HEAT



for Greater Profits
—with a "Shield-Arc"

Photo courtesy of R. C. Mahon Co., Detroit, Mich.

YOU can turn on all the heat the job will stand without splattering and wasting electrode metal—when you weld with a *"Shield-Arc."* Its uniform current puts more of the electrode metal into the weld—and does it faster.

"Shield-Arc's" high capacity lets you turn on the heat and use larger electrodes. Often you can cut welding costs 10% to 25% by using a size larger electrode.

"Shield-Arc's" greater efficiency actually increases as you turn on the heat. Power costs are less. *"Shield-Arc"* gives you more welding per kilowatt-hour or per gallon of gasoline.

Users report savings from $65 to as high as $160 per month per welder by using a *"Shield-Arc"* instead of their older equipment. Find out how much a *"Shield-Arc"* welder can save you. Ask The Lincoln Electric Company, Cleveland, Ohio. Largest Manufacturers of Arc Welding Equipment in the World.

LAD "I see they're tearing down the buildings across the way to save taxes."

POP "Wrong way round, Lad; someone should be tearing down taxes to save the buildings. Taxes eat up money almost as fast as bare rod welding. Think of the money we saved since we switched to 'Fleetweld' electrodes."

W-130

LINCOLN

"SHIELD-ARC" WELDERS

Heat Treating Metals with Controlled Atmospheres

USE of controlled atmospheres in various phases of the heat treatment of metals provided an absorbing subject for approximately 200 members of the American Society for Metals who met in Dayton, O., April 15, at the seventh annual Tri-Chapter meeting of the Cincinnati, Columbus and Dayton chapters. The meeting was held in the Engineers' club, and the program consisted of the controlled atmosphere symposium at a session in the afternoon, and a dinner in the evening followed by a second technical session. R. P. Koehring, metallurgist, Moraine Products division, General Motors Corp., and chairman of the Dayton chapter, presided as general chairman.

The meeting was attended by representatives of the Cleveland, Indianapolis and Pittsburgh chapters, and the national officers were represented by Secretary W. H. Eisenman, Cleveland. F. L. Meacham, manager, materials and process engineering division, General Motors Corp., and a past chairman of the Dayton chapter, was master of ceremonies at the dinner at which Dr. Anson Hayes, director of research, American Rolling Mill Co., Middletown, O., was the speaker. Dr. Hayes traced the growth of the United States and the life of its people, pointing out the dependence which has been placed on metals and machine-made products. He predicted important progress in metal production and use in the years just ahead.

Campbell Lecturer Speaks

Featuring the evening meeting was the re-presentation by Dr. V. N. Krivobok, associate director of research, Allegheny Steel Co., Brackenridge, Pa., of his Campbell memorial lecture delivered at the annual meeting of the American Society for Metals in New York last October. This lecture, "Alloys of Iron and Chromium," was abstracted in the Oct. 8, 1934, issue of STEEL. It recorded the lecturer's interesting discoveries concerning the strengthening and toughening effect of nitrogen in carbon-free chromium alloys. In re-presenting the work, Dr. Krivobok included data acquired since the original lecture.

Papers presented at the afternoon symposium were: "Use of Controlled Atmospheres in Joining of Metals," by H. M. Webber, General Electric Co., Schenectady, N. Y.; "Use of Controlled Atmospheres in the Heat Treatment of Tools," by S. K. Oliver, Delco Products division, General Motors Corp., Dayton, O.; and "Use of Controlled Atmospheres in Production Heat Treating and Forging," by R. J. Cowan, Surface Combustion Corp., Toledo, O. R. T. Bayless, assistant secretary, American Society for Metals, Cleveland, was chairman.

Mr. Webber's paper dealt with the process of brazing in controlled atmosphere electric furnaces; in recent years this process has found extensive use in the manufacture of double-walled steel tubing, tungsten carbide tools, steel fin condensers, and parts for cash registers, computing machines, sewing machines, automobiles, refrigerators, etc. The speaker outlined the fundamentals of the process, enumerated the metals which can be brazed, and described various brazed assemblies.

Mostly Copper Brazing

Low-carbon steel is the most common metal brazed, although various carbon and alloy steels are handled with comparative ease. For these materials, copper is the brazing metal usually employed, although nickel-silver, brass, bronze, silver solder, etc., are sometimes used. Steels containing chromium, aluminum and silicon in certain percentages prove troublesome to handle, and require special treatment. Nonferrous metals also are electric furnace brazed, in which case it is necessary to choose brazing metals which melt at lower temperatures than the body metals.

Brazing furnaces usually are of the continuous or semicontinuous type, although pusher-type, bell-type, pit-type, and others, are in service, according to Mr. Webber. Although hydrogen makes an excellent atmosphere, as does dissociated ammonia which is 75 per cent hydrogen and 25 per cent nitrogen, the most commonly used gas atmosphere is an inexpensive mixture formed by partial combustion of natural gas, coke oven gas, butane or propane. This mixture contains about 20 per cent hydrogen, 12 per cent carbon monoxide (both of which give a reducing effect at 2100 degrees Fahr.), 3 per cent carbon dioxide, and 65 per cent nitrogen. This gas costs only 10 to 50 cents per thousand cubic feet.

Discussion following Mr. Webber's paper brought out that steel passed through a reducing atmosphere in the brazing process has an increased tendency to oxidize; also, in some cases, there is a tendency for some steel to become slightly decarburized. Parts to be brazed ordinarily are designed for metal to metal contact, this being considered the best practice. A gap of 0.003-inch is the maximum into which copper will flow satisfactorily and give good results.

Mr. Webber stated that if parts are thoroughly cleaned, no hydrogen is required to effect the brazing operation, however, if there is moisture present and oxidation occurs in the furnace, the proper amount of hydrogen must be put into the atmosphere to clean up the steel so that a good brazing job is effected. Distortion is not a problem of any great moment in electric furnace brazing. Heat treating subsequent to brazing has been shown to have no material effect upon brazed joints.

Stainless steels are most difficult to braze, said Mr. Webber. The operation can be done if a flux is used, but even then the process is difficult. Stainless steels, therefore, are the most troublesome to handle. Some attempts have been made to use electric furnace brazing in manufacturing duplex tubing with a stainless steel inside lining, however, this work has not been carried very far. The brazing operation is difficult enough in itself, but a question arises as to whether the stainless steel will retain its corrosion-resisting characteristics after it has passed through the brazing cycle.

Film Reviews Hardening

Reversing the usual order, Mr. Oliver started his paper by showing a motion picture illustrating progress to date in tool hardening. This picture began with the blacksmith and followed through the various methods of hardening including pack hardening, molten bath hardening, high speed furnace hardening and controlled atmosphere furnace hardening. Hardened dies showed the results obtained by the various methods. The film illustrated more clearly than words how unreliable were some of the early methods.

In beginning a study of tool hardening methods in his own plant, Mr. Oliver believed the troubles could be solved by using the same atmosphere in hardening high speed steel as Sam Tour used in New York. Mr. Tour has claimed that with a preheating atmosphere of 3.00 per cent O_2 and 11.8 per cent CO_2 along with a hardening atmosphere of 8.2 per cent CO_2 and 5.1 per cent CO, grain growth is inhibited and pieces can be hardened without scale or soft skin. However, use of this atmosphere in Dayton in equipment identical with that used by Mr. Tour, resulted in the finished hardened pieces sloughing off to the extent of 0.005-inch per 10 minutes in the hardening heat. Furthermore, no correlation was found between grain growth and atmosphere.

As the next step, Mr. Oliver came within 225 miles of home and inves-

tigated the atmospheres being used by several plants in Cleveland without any apparent sloughing off of the metal or decarburization of the surfaces. These plants were using a preheat atmosphere of 1 per cent CO and 7 per cent CO_2 along with a hardening atmosphere of 8 per cent CO and 5 per cent CO_2. Equipment was set to duplicate these atmospheres but work hardened lost 0.002-inch per 10 minutes at hardening heat and also developed a skin approximately 0.003-inch thick.

These experiences raised the question as to why an atmosphere is effective in one locality and yet a failure in another. Thereupon, Mr. Oliver and his associates undertook to find a solution. They set out on a detailed study of atmospheres used with high speed steels, atmospheres used with water and oil hardening types of tool steel, atmospheres used with high carbon-high chromium steel, and atmospheres produced by cracking blended oil.

Offers Logical Solution

On the basis of the results, Mr. Oliver offered what he considered to be a logical solution to the problem. He dismissed, at least for the time being, ratios, moisture content and the inert gas theories, and in their place substituted atmosphere application. He proposed a furnace design and atmospheres, which, according to his experiments, will harden without scale or decarburization and in any locality all classes of steels beginning with the S.A.E. 1020 and finishing up with the complex molybdenum-tungsten high speed steels.

The furnace, shown in the accompanying illustration, can be of electric, gas or oil-fired type, with a length of approximately 6 feet and width of 3 feet. Through the length of this furnace pass three square or oblong heat resisting sheet metal muffles of 2-inch, 4-inch and 6-inch size, respectively. These muffles can be varied in size to meet individual needs. Three zones can be established by the hardener. For instance the hardener could set the controls for 600 degrees, 1200 degrees, and 1600 degrees, or 600 degrees, 1400 degrees and 1800 degrees Fahr. This would depend largely upon the type of steels to be hardened.

Maintaining the Gas Analysis

The required gas analysis of the zones indicated by the illustration is maintained by a flow of air and gas ratios entering at the point marked "inlet." For hardening tool steels, requirements would be to first set the temperature zones for the particular steel, turn on the atmosphere and start pushing the parts through the furnace.

Answering questions concerning furnace atmospheres, Mr. Oliver stated that lower than 4 parts of air and 1 part of natural gas requires frequent replacement of thermocouples. Iron-constantin couples hold up well, but they become sooted up. E .F. Burke, C. I. Hayes Inc., Cleveland, agreed with the speaker on the variation of atmosphere effectiveness in different locations. He regards a furnace as a tool and the more regulation or controls which can be given to this tool by simple methods, makes the tool more effective. He also emphasized that it is impossible to analyze the atmosphere at furnace tem-

W. S. Evans, Globar Corp., Cleveland, pointed out that humidity and drafts in the toolroom may have some effect on furnace atmospheres. One metallurgist believes barometric pressure may have some influence. One speaker suggested that the barometer varies little and plant atmosphere varies little, therefore, possibly the lining of a furnace has a bearing on the furnace atmosphere.

In presenting his paper, Mr. Cowan stated that in the heat treatment of metals in special atmospheres it is not sufficient to say "here is an atmosphere, go ahead and use it." The way in which these atmospheres are used is very important. The speaker referred to the carbon monoxide-iron equilibrium diagram and pointed out that five different reversible reactions take place and in each of eight zones, illustrating the complexity of the atmosphere problem.

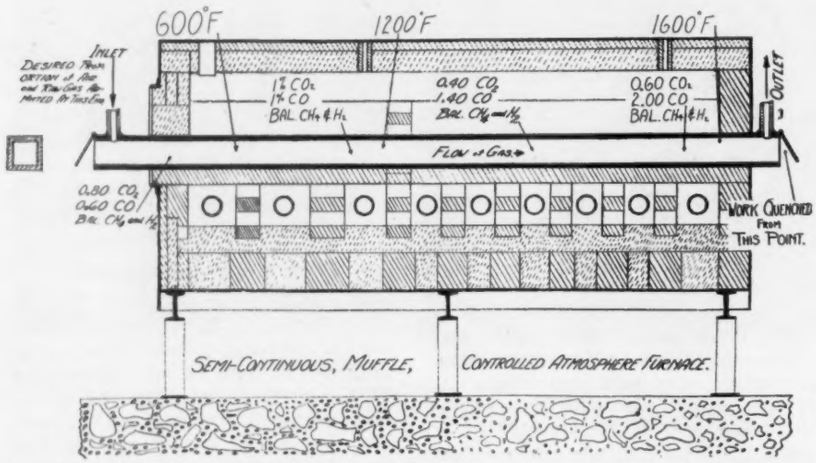
It is not always necessary to have elaborate furnace equipment to do good work, Mr. Cowan maintained, for after all a pretty good job of annealing, for example, can be done in an open-fired furnace. In this type of furnace, it is possible to produce the type of scale desired by rendering the atmosphere oxidizing or reducing. Often times, however, this is not enough, but it may not be necessary to go to a muffle furnace. Free carbon, properly applied through a smoke burner, can be made effective. Copper can be bright annealed at the usual annealing temperature, but discoloration will result in cooling, therefore, why not use the controlled atmosphere only in the furnace cooling zone?

Wide Choice of Atmospheres

The speaker explained the principle of diffusion combustion in which gas and air are introduced in the furnace in layers. Next he discussed deoxidizing gas atmospheres which are the products of the combustion of gas and air, and cracked gas atmospheres which are produced by cracking gas outside the limits of flamability. These two atmospheres sometimes are combined in use. Gas atmospheres must be utilized in furnaces in connection with the proper catalysts. By slides, Mr. Cowan showed numerous types of furnaces and gas atmosphere units which operate in connection with them.

A promising future was predicted for the recently developed radiant tube furnaces which utilize no baffles. Combustion takes place within alloy tubes and the products of combustion do not come in contact with the furnace charge. Radiant tubes usually are made from 28 per cent chromium, 12 per cent nickel alloy and have long service life.

Answering a question concerning the bright annealing of brass, Mr. Cowan stated that an atmosphere of methanol is effective down to temperatures as low as 700 degrees Fahr., still producing a bright finish at this temperature. Some atmospheres, he pointed out, are satisfactory at the annealing temperatures, but are ineffective at lower temperatures.



Proposed design for a controlled atmosphere furnace to harden all classes of tool steels in any locality without scale or surface decarburization. Three zones are established and the proper atmospheres to be maintained in these zones are indicated

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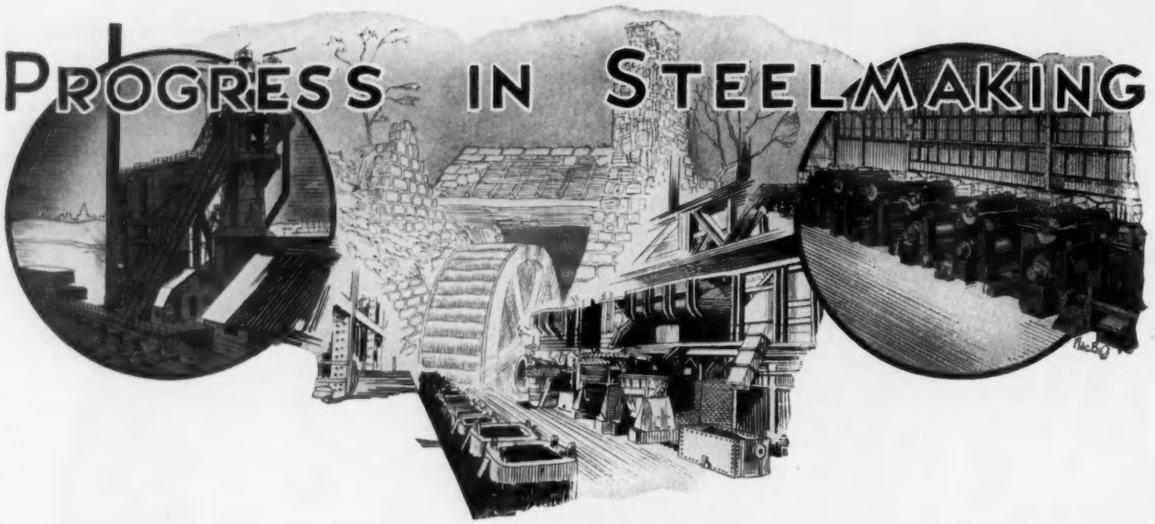


Repairs Seat by Welding

Repairing an 8-inch crack in the hot blast valve seat of a stove serving a stack in the Pittsburgh district recently was accomplished by welding. The preparation, preheating and welding operations required six manhours, 5 pounds of No. 22 manganese bronze, about 40 cubic feet of oxygen, 43 cubic feet of acetylene and 6 bushels of charcoal.

♦ ♦ ♦

Alloy Mandrels Are Used

Tungsten carbide mandrels now are being employed for finishing the interior diameters of steel tubing. The use of these mandrels has been confined largely to the manufacture of alloy tubing but some mills, which have improved their lubricant, now are making general use of these mandrels.

♦ ♦ ♦

Facilitates Drum Inspection

Clear-sighted inspection of barrels, drums, gas mains and tanks at blast furnaces and steel plants without the hazard of explosion is afforded by a vapor-proof light designed to permit insertion through standard bungholes 2¼ inches diameter and larger. Protection to lamp and lamp socket is provided by a sealed glass tube with a slotted brass guard.

♦ ♦ ♦

New Steel Is Marketed

Molybdenum, tungsten, chromium and vanadium are the principal alloying elements in a newly marketed steel. The technique of working this steel is similar to that which was developed for the class of high-speed steels containing 18 tungsten, 4 chromium and 1 per cent vanadium. Tools made of the new molybdenum-tungsten steel normally exhibit greater hardness than those made of 18-4-1, but have toughness equal or better.

♦ ♦ ♦

Reduces Time of Heating

Full finished autobody sheets now are being annealed in the plant of a large steel company by the use of a radiant tube annealing cover. The installation comprises a steel shell lined with high-grade insulating refractory, and a similarly constructed base. This cover is heated by radiant tube elements placed in a horizontal position along the side walls and extending through the end walls by means of diffusion combustion in which gas and air enter the tube at the inlet end and combustion takes place progressively along the inside of the tube, terminating at any place desired. This type of combustion produces a soft but radiant flame, which permits a high rate of heat transfer with a low thermal head and an increased efficiency over premixed combustion. The operation of the cover is fully automatic. Once the burners are set, instruments control the operation of the burners until the desired temperature is obtained, when the gas is shut off manually and air is applied to accelerate cooling before removing the cover. Due to the basic principles employed in its design, this cover will produce bright annealed steel sheets. Piles of sheets 58-inch high by 65-inch wide and 115-inch long are said to be heated uniformally from end to end within 10 degrees Fahr. and with no temperature differential top to bottom, with a fuel consumption less than 1,000,000 B.t.u. per ton and a considerable saving in time of heating.

Wanted—Coatings for Permanent Molds

"We are interested in coatings for permanent ingot molds for the casting of ferrous and nonferrous metals," writes one of STEEL's subscribers. "Will you please give us such information as you have on this subject".

♦ ♦ ♦

Lowers Maintenance Cost

Rebushing the sheave blocks of a ladle crane serving an open-hearth shop in the Pittsburgh district formerly was necessary about every six to nine months. Six years ago the sheaves on this crane were equipped with antifriction bearings. Since then replacements have been unnecessary and maintenance costs greatly reduced.

♦ ♦ ♦

New Cement Is Acidproof

Protection against water, fumes and many solvents is afforded by a new cement of high silica content which hardens by chemical set into an acidproof, porcelain-like structure and resists temperatures of 2000 degrees Fahr. The cement is supplied in powder form to be mixed with water on the job and is resistant to all hot and cold acids except hydrofluoric. Complete set occurs in 24 to 36 hours.

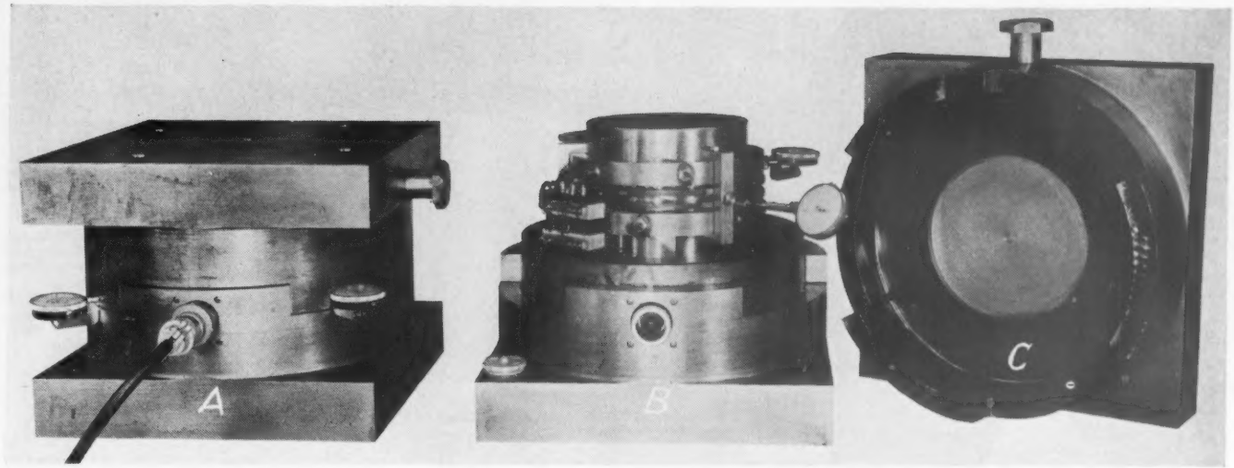


Fig. 1—Pressure block construction. An assembled unit is shown at the left (designated A) and a block (B) with the top housing (C) removed at the right

New Device Indicates and Records Rolling Loads

DURING recent years improvements have been made in rolling mill design and practices. Proper and uniform heating of the stock to be rolled always has been important and to insure these results improved furnaces have been built with exact temperature control and recording instruments. Correct chemical content of the stock to be rolled is fundamental. The elements entering the furnace are carefully specified and weighed. Specimens are taken from each heat and check tests made. Scientific control is maintained through reliable knowledge of the facts.

About 1930, Baldwin-Southwark Corp., Philadelphia, the Rollway Bearing, Inc., Syracuse, N. Y. and O. S. Peters co-operated in tests of rolling mill pressures using cylindrical steel blocks under the screwdowns with McCollum-Peters carbon pile telemeters to transform the block deformation to electrical resistance changes and cause an oscillograph light beam to trace a record on a moving film from which the rolling loads were evaluated.

Many of the pressure blocks have been installed. Savings have been made in mill maintenance, added insurance against overload has been provided and rolling schedules have been adjusted from the pressure standpoint with the result that lower pressures are being used, faster rolling speeds are maintained, tonnage is increased and cost per ton is decreased.

These blocks are made in some form of steel construction that will fit between the bearing chuck and the screwdown of a rolling mill and be of sufficient strength to withstand the most severe mill loads. At the same time the loads will cause the slight deformation of the block that is necessary to produce functioning of the electrical apparatus.

How Unit Is Built

At the left in Fig. 1 is an assembled unit and at the right a block with the top housing removed. The blocks consist of a top and bottom housing enclosing a solid steel cylinder with metal bands and electrical apparatus attached. The housings are made square top and bottom and are interlocked where they meet. The square portions provide means of preventing relative movement between the housings and the bearing chuck and breaker block. The interlocking prevents rotation of any of the parts when the screwdown is turned under load. This construction insures that compression forces only act on the cylinder within the housings. This cylinder is the sensitive weighing unit.

The cylinder is of solid steel and of such size that it is stressed well within its fatigue limit, is of high quality alloy steel of a nonstress hysteresis type and is long enough to keep the two housings from touching each other so all the load carried through the block is carried by the cylinder. This load causes the steel cylinder to take a slight barrel shape, enlarging the central circumference.

The rings attached to the cylinder are complete circles cut at one point (as the cylinder expands under load the rings open at the cut). Across this cut, air-gap transformers or magnetic gages are fastened with one set of coils connected to one end of the split rings and the moving coil or armature connected to the other end. This construction provides relative motion between the parts of the electrical apparatus and permits, therefore, an indication proportional to the rolling mill pressure.

To transmit the movements of the split ring ends into load indications, a small motor generator set provides alternating current of constant voltage and frequency which is necessary for energizing the electrical apparatus. Rheostat and voltmeter are provided to keep the voltage at proper value. When energized, the transformer or magnetic gage movements cause electrical impulses to pass through indicating and recording meters whose pointers move in proportion to the steel cylinder expansion and the load producing it. The apparatus is calibrated at the bureau of standards and the meters show directly in pounds the loads under each screwdown of the rolling mill. (Patent applications have been made on this type of pressure block and the auxiliary apparatus).

The design and construction outlined must not be understood as a unique or limiting arrangement. This design is particularly suitable for heavy loads—3,000,000 pounds and upwards.

Hollow cylinders can be used for somewhat medium loads and circular, elliptical or horse-shoe shapes are more suitable for light loads. The underlying principles are, however, the same; viz., a steel member undergoing a deformation action when loaded, and electrical system for the translation of such strain into

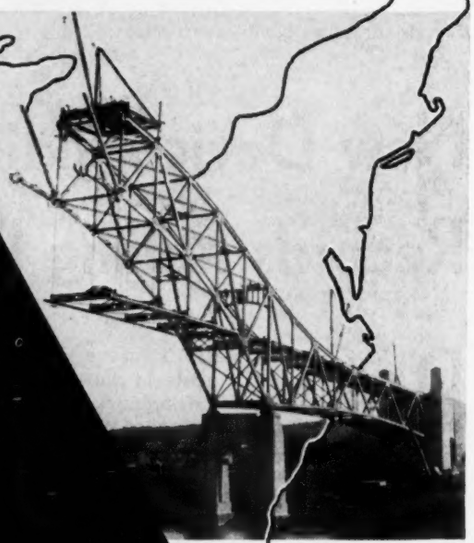
A B C SERVICE IS Nation-wide

North: Service Bridge and Tainter Gates, Mississippi River Dam at Canton, Mo.

South: Mississippi River Bridge at New Orleans, La.

East: Sagamore Highway Bridge over Cape Cod Canal, Bourne, Mass.

West: Towers for West Bay Suspension Spans, San Francisco - Oakland Bay Bridge.



RESOURCES in and behind every department of its work—experience in the personnel, equipment and capacity in the fabricating plants, organization and skill in the field corps — enable American Bridge Company to execute competently, anywhere, any undertaking in the use of structural steel. The illustrations here shown represent four of many projects, large and small, in widely separated parts of the country, on which this Company is just at present engaged.

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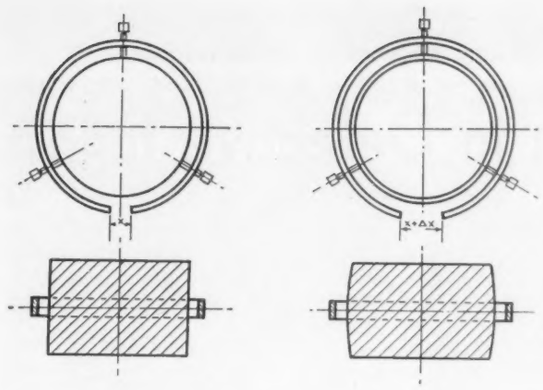

Fig. 2 — Swelling of a steel cylinder when loaded axially. Small deformations (a few thousandths of an inch) cause one part of an electrical instrument to move in relation to another part. These varying movements cause indicating and recording meters to show the load that caused the deformation

electrical quantities which due to a previous calibration, are measurable directly as load to be determined.

In mills using rollers bearings a charge is set up for the replacement of bearings varying in amount from, say, 15 to 50 cents per ton of material rolled. This charge is for the replacement of bearings only and does not consider the loss of production during the time the mill is shut down nor the fact that the large investment is standing idle, which expense probably would equal the actual cost of bearing replacement. These bearing failures generally are traceable to abuse of the bearings through overloads.

Chart Indicates Pressure

With a chart before the mill operator of a 4-high mill he can see what pressures are being used on each screw of all stands equipped with blocks, since such a chart would be produced for each block used. The roller can operate the mill within definitely prescribed limits. If he fails to do so it is shown on the record and in case of a failure, a knowledge of the rolling pressures at that time immediately is available.

A large manufacture of sheets and tin plate who operates his mills within specified maximum pressures advised that the maintenance expense has been reduced materially and brought under control, whereas without the blocks he would be at a loss to know the cause of the trouble and how to remedy it.

Some mill men have the idea that any reduction can be rolled if the mill is heavy enough in construction and is equipped with sufficient screwdown power. Such is not the case for at least three reasons:—

1. As the pressure increases the rolls sink further into the sheet and a progressively larger contact area results in less pressure per square inch.
2. The thinner the material the greater resistance it exerts to further reduction.
3. As the pressure increases the working rolls flatten more and more, resulting in a further increased contact area with the sheet.

For these reasons, a limit is reached where further pressure does not produce a thinner sheet. Nevertheless, in an effort to overcome these conditions, rolling mill operators keep screwing down harder and harder, which practice results in rapid roll deterioration, frequently causing bearing failures and broken roll necks.

By the use of pressure blocks the mill can be operated under safe maximum pressures to insure less roll turning and replacements and yet produce the same reductions as if the heavier loads were used.

The proper heating of materials coming to a hot mill is of extreme importance, and in a mill using pressure blocks variations in heat are made apparent at once in pressure variations. It sometimes happens that a crew in attempting to get out certain tonnage tries to hurry the material through the mill before it is heated properly. This often results in double or more pressure than should be used. Pressure blocks not only will detect this trouble but will correct it and eliminate breakdown due to this cause.

In a mill with crowned rolls if too light pressure is used the sheet will be thin in the middle. If too much pressure, it will be thin at the edges. Rollers quickly learn the pressure limits within which they must work and they control the settings wholly on a pressure basis.

Where flying micrometers are used, often a mistake is made in the gage setting. This immediately is detected in the pressure blocks and the necessary correction is made before a quantity of material—which must be scrapped—is rolled. In thus using the pressure blocks much setting time is saved and the rolling of waste material is prevented.

Rolling Friction Varies

Power used by any rolling mill greatly exceeds the theoretical calculated requirement based on an assumed apparent or instantaneous plastic stress value in the stock being rolled. This excess power requirement mainly is caused by the surface friction between the rolls and the stock. This friction varies with rolling pressure, speed of rolls in relation to entering and exit speeds of stock, draft, contour rolled, spread, temperature of stock and other factors. Schedules of operations have been worked out using pressure blocks, relating the various factors to pressure indications so that the minimum of power is used in friction. The savings in power in many cases are large and at the same time ton-

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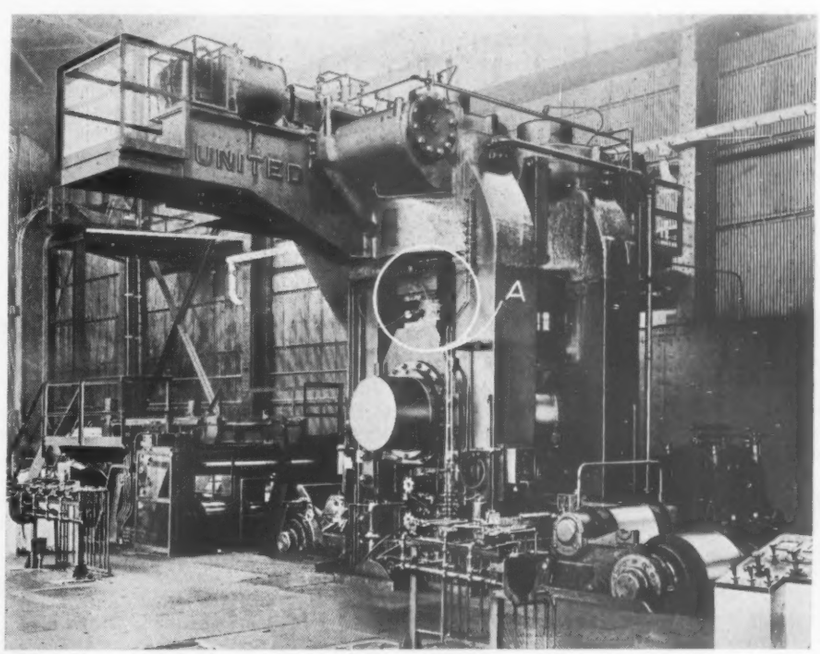


Fig. 3—Four-high broad strip mill showing the location of pressure block (designated A) beneath the screwdowns

Pulling Heats Too Quickly After Pouring Results in Defective Ingots

STEELMAKERS probably have passed the peak of operations. In the opinion of some economists, the industry may expect a gradual decline until near the close of the third quarter and then a pick-up greater than that of a year ago.

The foregoing was included in the introductory remarks of L. F. Reinartz, chairman, Open-Hearth committee, American Institute of Mining and Metallurgical Engineers, at the opening session of the eighteenth annual meeting held at the Netherland Plaza hotel, Cincinnati, April 11-12. Approximately 240 members and guests attended the meeting, which is the largest attendance since the committee was formed.

Mr. Reinartz warned against various bills now before Congress including the 30-hour week, the Wagner Labor bill and social security. The 30-hour bill, he pointed out, offers little help to employes and management. The employe will have more leisure but no more pay. If the Wagner bill is passed, he continued, the country will be plunged into a series of strikes and the stage will be set for disputes between management and employe.

G. D. Tranter, general superintendent, Middletown division, American Rolling Mill Co., Middletown, O., in speaking on the mechanical phase of ladle and teeming practice emphasized features of standard practice which often are neglected in the routine of pit operation.

Ladle brick, he asserted, should be sufficiently dense to prevent excessive slag penetration and have the proper constituents to resist the fusing action of the slag and metal. By using the proper proportion of arch, wedge and squares more uniform lining practice is obtained.

Assembly Is Important

Stopper rod assembly, he brought out, requires workmanship of a specialized nature and best results are obtained where the work is assigned to a regular stopper rod maker who is responsible for assembling and drying the rods used by all shifts.

A drying oven is necessary for drying the assembled rod before placing in the ladle. A description of the oven mentioned by Mr. Tranter was presented in the Feb. 22, 1932 issue of STEEL, page 23.

Oval shaped nozzles have an advantage where slab shaped ingots are poured. An improvement is noted with the use of the longer nozzle in that it prevents spraying of the metal stream to a large extent.

Various mold coatings are used with graphite or tar predominating, he explained. A pouring cycle of about eight to ten-hour intervals usually is established to avoid pouring into hot molds or molds which are too cold.

Pulling heats too quickly after teeming has been found to have considerable bearing on the formation of interior defects, according to Mr. Tranter. Repeated experiments have demonstrated that certain types of laminations result from moving the ingot too quickly after pouring and charging into soaking pit too rapidly. The possible delay in holding the heat 15 or 20 minutes is more than compensated for by improved quality results.

Ladle trunnions should be inspected frequently for defects and flaws which may develop as a result of over-flowing slag. Crane runways should be checked regularly for loose rivets and worn rails.

How long should an ingot be held after pouring?

In reply, one operator stated that the length of time steel is held depends upon the size of ingots cast. Those weighing from 2½ to 5 tons are held from 1¼ hours up to 2 hours from the time of the finished pour.

At another plant killed steels are held in the mold from 1 to 1¼ hours from the start of the pour.

Ingots of rimming steel weighing up to 1500 pounds are held for 1 hour after the pour and killed steel ingots 2 hours after the pour, according to the practice at an Ohio shop.

Further discussion on teeming practice brought out the fact that mold caps for rimming steel used at one plant on 18 x 39-inch ingots are 1½ inches thick and weigh from 175 to 200 pounds. The mold is capped after the ingot has rimmed in about 3 inches.

Has anyone tried basic linings for ladles?

An open-hearth operator replying to this question mentioned that he had relined four ladles with a mixture of 20 per cent portland cement mixed with magnefrit. A coating of this mixture, 2½ inches thick, was applied over the brick lining.

After each ladle handled five or six heats a skull formed in the bottom. In removing these skulls the brick lining was damaged and had to be renewed. Results of his practice on basic and brick lined ladles follow:

	Silica, per cent	Phos., per cent
BASIC LINED LADLE		
Slag before tapping	16.50	0.910
Ladle slag after pour..	21.50	0.910
BRICK LINED LADLE		
Slag before tapping	16.50	0.930
Ladle slag after pour..	30.50	0.670

Analysis of the slag from the basic and brick-lined ladles follows:

	Basic lined	Brick lined
SiO_2, per cent	23.18	31.68
CaO, per cent	44.28	31.03
MnO, per cent	8.65	9.44

Magnesite was used by a Pennsylvania open-hearth operator for lining ladles but the practice was discontinued. No more skulling resulted than was observed under usual practice. However, the speaker stated, the slag seemed to grow on the brick similar to blisters.

What method is used to make up tap holes?

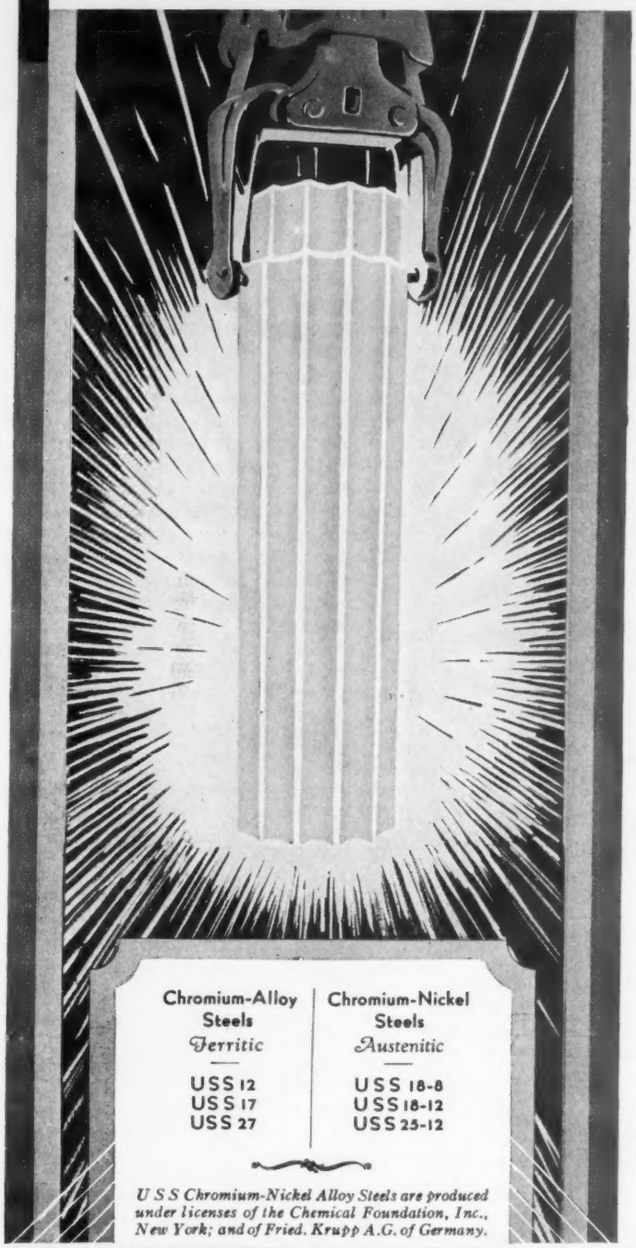
In commenting on this question a Pennsylvania steelmaker mentioned that he used magnesite mixed with chrome ore and 10 per cent cement, on a 6-inch tap hole. At a Canadian plant No. 695 mix is employed. Since this mix was adopted the life of the holes has been almost doubled, the average this year being 23 heats, compared with 12 heats before the mix was adopted. At this same plant a basic ladle wash using No. 695 plastic greatly increased the life of the ladle lining. Under former practice ladle linings lasted 2 to 3 heats, whereas linings washed with No. 695 plastic have handled up to 25 heats.

What results are obtained from two-stopper ladles?

A better ingot surface is obtained by using one nozzle for the first 3 or 4 molds and then open up the second nozzle, according to the practice at one plant. The use of elliptical ladles affords a better surfaced ingot, less variation in the temperature and a better interior ingot structure. After pouring 10 or 11 ingots of dead soft steel at one plant, the nozzle became badly cut. Later difficulty with the stopper head developed, the bolt melting and the head coming off. The adoption of two-stopper ladles remedied this trouble and improved the quality of the ingot.

Has anyone used aluminum as a

FOR THE MOST EXACTING USES



Chromium-Alloy Steels *Ferritic*	Chromium-Nickel Steels *Austenitic*
USS 12	USS 18-8
USS 17	USS 18-12
USS 27	USS 25-12

U S S Chromium-Nickel Alloy Steels are produced under licenses of the Chemical Foundation, Inc., New York; and of Fried. Krupp A.G. of Germany.

USS

STAINLESS
AND HEAT RESISTING
STEEL SHEETS
and Light Plates

Indicate your particular field—food preserving, milk plant, chemical, industrial, manufacturing, architectural, domestic—and your specific requirements, and our technicians who are specializing on these STAINLESS Steels will recommend a sheet or plate appropriate in cost, and adapted to your needs. New problems will be considered carefully in order that discriminating advice may be given.

Inquiries regarding any application of sheets or light plates, or to any product fabricated from either, will be given careful attention. Write for literature and complete information.

Correspondence is invited by the Companies named below — each with respect to the forms of steel that it produces:

AMERICAN SHEET AND TIN PLATE COMPANY, *Pittsburgh* - - - - - - - - - SHEETS AND LIGHT PLATES
AMERICAN STEEL & WIRE COMPANY, *Chicago* - - COLD ROLLED STRIP STEEL, WIRE AND WIRE PRODUCTS
ILLINOIS STEEL COMPANY, *Chicago* - - - BARS, PLATES, SHAPES, SPECIAL AND SEMI-FINISHED PRODUCTS
CARNEGIE STEEL COMPANY, *Pittsburgh* - - - - - SHAPES, PLATES, BARS AND SEMI-FINISHED PRODUCTS
NATIONAL TUBE COMPANY, *Pittsburgh* - - - - - - - - - - - - - - PIPE AND TUBULAR PRODUCTS

Pacific Coast Distributors—COLUMBIA STEEL COMPANY, San Francisco, Calif. *Export Distributors*—UNITED STATES STEEL PRODUCTS CO., New York, N. Y.

United States Steel USS *Corporation Subsidiaries*

USS STAINLESS
AND HEAT RESISTING STEELS

mold wash for rimming or killed steel? How mixed? How applied?

At one plant 2/3 pint of pulverized aluminum powder is mixed with 8 quarts of bronzing liquid and applied to the ingot mold with a brush. At another plant aluminum powder or aluminum paste is mixed with aluminum-resisting oil in the proportion of 1¼ pounds of powder to 1 gallon of oil. This material is beneficial on alloy and high-carbon ingots but the results are reported to be better on oxidized than on open steel.

Instead of using aluminum mold coat an Ohio maker dips his molds in tar and reports highly satisfactory results. The Germans advocate asphalt lacquer in preference to tar, it was brought out.

A definite relationship exists between the successful use of tar as a mold wash and the corner radius of the mold, according to a steelmaker. The general consensus of opinion is that tar is not successful on molds made with a large corner radius inasmuch as it causes cracks in the ingot.

What results are being obtained by the use of copper stools?

Discussion brought out the fact that stools made of copper from refineries and of suitable size give highly satisfactory results. When they are built of the proper weight and thickness there is an absence of sticking. Tests show that an iron mold lasts longer on a copper stool than on an iron steel. The reason for this is that the bottom of ingot cools faster and the steel gets to a lower temperature sooner than when cast on an iron stool. Temperature measurements of a cast iron stool taken at a point under a rectangular ingot where the stream hits disclose 1500 degrees Fahr. compared to 660 degrees for a copper stool. About 1 foot beyond where the stream of metal strikes the temperature of the iron stool was 800 degrees compared to 500 degrees for the copper unit.

In discussing the use of copper in mold stools and inserts a maker cited test data to show that the ratio of mass of ingot to copper is not a factor in the cutting or welding of the copper.

Loss on the butt end of big end up ingots due to cracking, he pointed out, has been reduced to nearly nothing compared to a loss of 2 to 5 per cent on plug bottom molds. On big end down molds the crop loss due to fins, scabs, fish-tailing and manufactured pipe on rimming steel has been reduced to practically nothing compared with a 2 to 5 per cent loss from flat cast iron stools. Ingot defects from splashing have been reported reduced by at least 50 per cent. On certain grades of electric furnace steels, he stated, the surface porosity on the butt end of the ingot has been eliminated completely. These benefits, he disclosed, have been obtained because the dish in the insert is so shaped that the steel does not splash against the side of the mold and because it does not weld to the copper to cause cracking.

Analysis of scum on the top of a rimming ingot varies from heat to heat stated R. C. Good, metallurgist, Electro Metallurgical Sales Corp., Pittsburgh. Composition of the scum may be modified intentionally he pointed out. Scum is a collection of the oxide rising out of the rimming steel ingot and it is a factor to be considered in regulating the escape of gas. By increasing the acid constituent of the oxide inclusions, the melting point is lowered and, as the speaker pointed out, a lower melting point inclusion increases the fluidity of the steel without any change in the temperature or composition of the steel. Improved fluidity favors the release of gases, which in turn regulate the top of the ingot and its internal structure (disposition of blowholes).

Study of residual metals in open-hearth steel has been continued at Battelle Memorial institute, Columbus, O. Results were reported for the period February, 1934 to January, 1935, inclusive. The average, by plants, shows nickel remaining constant, a drop of one point in manganese, a slight drop in chromium, a slight increase in tin, and an appreciable increase in copper. The average of all plants, by tonnage capacity, shows tin and chromium remaining constant, a drop of one point in manganese, and an appreciable decrease in nickel, and an appreciable increase in copper.

What deoxidizers other than aluminum effect grain size?

Zirconium exerts a refining influence on the grain structure according to a metallurgist. Titanium, used alone has no effect on grain size but when used with aluminum the effect is highly beneficial.

Is there any difference in the quality of steel produced with all raw limestone charge compared to all-burned lime charge?

Two open-hearth operators report better practice by the use of burned lime. Another operator reported little difference on killed steel practice whether burned or raw lime is employed. On the other hand an operator reported a saving ranging between 40 and 45 cents per ton by using burned lime.

What is the effect of high or low residual manganese on rimming steel?

In answering this question one open-hearth operator pointed out that the lower the residual manganese the better the steel rims. However, the lower the manganese content, the higher iron oxide in the slag. When the residual manganese content surpasses 0.20 per cent trouble is encountered in rimming.

What open-hearth practices cause defects and rejections later on in extra deep drawing steels?

Too much ore will lead to defects in this grade of steel, stated one producer who set a limit of 8000 pounds of ore on 150-ton heats. The percentage of pig iron used in deep drawing heats is about 45 per cent.

Attention was directed to the difficulty of detecting antimony in scrap. Scrap containing up to 35 per cent of this element is magnetic and therefore will pass into the charging boxes undetected.

During the past two years approximately nine methods of measuring open-hearth roof temperatures have been developed and installed. In discussing the protection of open-hearth roofs an instrument maker pointed out that the base metal thermocouple mounted in refactory blocks surrounded by a standard, water-cooled blast furnace tuyere is recommended for measuring roof "surface" temperatures. It is the safest means for control, he pointed out, but requires more intelligence for operation, since to procure the maximum safe speed of operation, the temperature limit should be reduced during the refining period.

Recommends Radiation Pyrometer

The exact amount and duration of this reduction is a function of the rate of heat transferred through the roof and the duration of the heat. He recommended the radiation pyrometer sighted upon a hollow refractory block built into the roof for measuring roof soaking temperatures. It is satisfactory for limit control, he explained, and in general may be relied upon so that, if a set limit is not exceeded upon the instrument, the section of roof where the radiation pyrometer is installed will not be damaged. For providing progressive record of roof conditions, the speaker recommended the installation of several thermocouples on various points of the roof. Such an installation, he explained, reaches its greatest usefulness when the roof gets thin, serving to lengthen the life of the roof considerably by giving the operator a guide whereby he can nurse weak roof sections.

At the final session which was devoted to the discussion of insulation, control and refractories an open-hearth superintendent described the method employed at his plant for insulating. About two years ago, he stated, we begin insulating our checker chamber walls and roof. We used insulating board 1½-inches thick and 1-inch board on top, then encased the chamber in a steel jacket. Later we insulated the

(*Please turn to Page* 52)

NEW EQUIPMENT

Bearing Closures—

Bearing Appliance Co., Ardmore, Pa., has introduced complete closures for antifriction bearings, finished and ready to use, for approximately 150 sizes of ball and tapered roller bearings in a number of sizes and types to meet many design combinations. Bolt fastening dimensions have been established, and for each group of bearings having similar diameters a number of parts, all having identically located holes, are provided. Fourteen sizes of cast iron covers for completely closing the bearing housings as well as open covers of various types are included in the line.

Among the latter are covers carrying felts, covers with flingers and

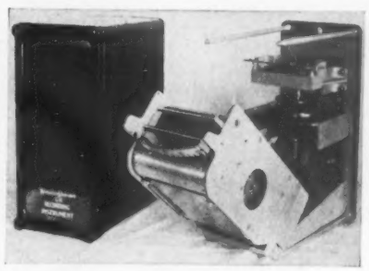
Bearing Appliance Co. cast iron covers for closing bearing housings

covers for the accommodation of standard leather or composition oil seals. Numerous shaft extension sizes can be utilized and the varying degrees of inside space offered permits mounting bearings with or without locknuts, in fixed or floating positions and with proper abutting shoulder diameters.

♦ ♦ ♦

Position Transmitter and Recorder—

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., recently developed a duplicate position telemeter system for indicating and recording at a distance the position of mechanisms such as bridges, gates, valves or water level in water power plants, engine governor positions, or the position of any important mechanism.



Receiving equipment for Westinghouse telemetering system

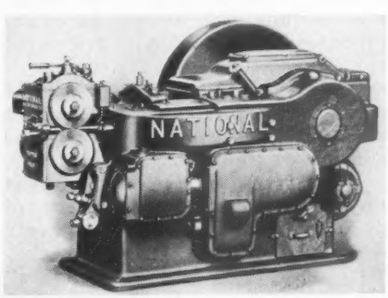
The type "GH" position recorder, shown herewith, is assembled in a rectangular case for switchboard panel mounting. An improved duplicate position type of motor operates a direct acting pen which records on a strip-type chart variations in the position of remotely associated mechanisms operating a motor-type transmitter.

♦ ♦ ♦

Open Die Cold Headers—

National Machinery Co., Tiffin, O., recently announced a new line of open die cold heading machines in all sizes. These units, one of which is shown herewith, operate either as relieving grip or solid die machines. By means of an adaptor the machine can be equipped with regular solid dies. When solid dies are used, the grip is locked in the closed position so that the die is rigidly held in alignment.

Another marked advantage of this machine is that it may be operated with split dies which are clamped solid. In this way, it can be operated as a solid die header with split dies on extremely long work, as long as no trouble from ejection develops. If, however, such trouble is encountered, it can be eliminated by opening the grip actuating screw which permits the machine to operate as an open die header.



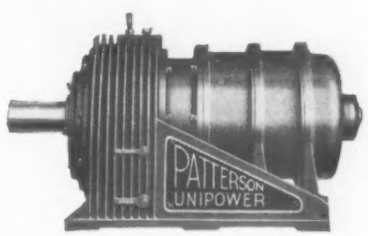
Open die cold header introduced by National Machinery Co.

In this type of open die header that portion of the shank to be roll threaded can be reduced by the process of extrusion simultaneously with the heading. The extrusion bush is gripped and held in proper alignment with the dies, and when the gripping pressure is relieved, the bush is free so that the blank can be ejected without any cramping tendency.

♦ ♦ ♦

Horizontal Reduction Drive—

Patterson Foundry & Machine Co., East Liverpool, O., has developed its Unipower gearless reduction drive into



Horizontal speed reducer developed by Patterson Foundry & Machine Co.

a complete line of horizontal modifications ranging in size from ¼ to 100 horsepower at all speeds. The units, shown herewith, are so designed that any standard frame size replacement motor may be installed upon them in the field. Output shafts are on centers with the motor shafts.

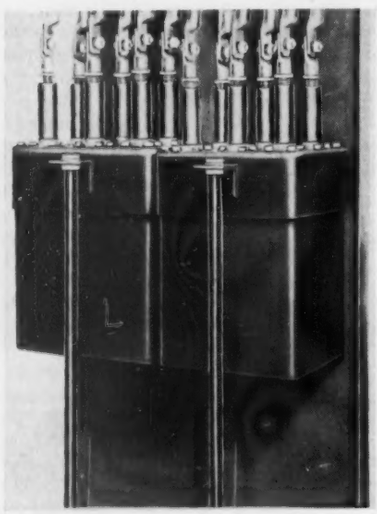
♦ ♦ ♦

Oil-Blast Breakers for Panel Mounting—

General Electric Co., Schenectady, N. Y., has announced new oil-blast breakers for panel mounting. The new units, shown herewith, are designated type FK-43 and are rated 600 amperes, 15,000 volts; 1200 amperes, 7500 volts; with an interrupting rating of 50,000 kilovolt-

amperes at the rated voltage.

Solenoid-operated breakers are equipped with the trip-free type MS-5 mechanism, insuring positive tripping when closing on fault currents; and rectifiers and current-trip coils are available for alternating-current



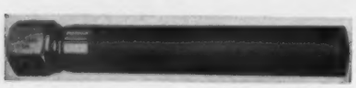
General Electric oil blast breakers for panel mounting

control. Manually operated breakers are provided with the trip-free HC-2 lever; and remote operation with the operating lever mounted on a panel can be arranged readily.

♦ ♦ ♦

Automatic Hose Valve—

Hunt Mfg. Co., 1619 Winona avenue, Chicago, is introducing an automatic hose valve for attaching to any free-end hose or overhead washer. With this device, shown herewith, water flows only when hose is being used on productive work. The device has a brass female connector threaded to fit any standard water hose



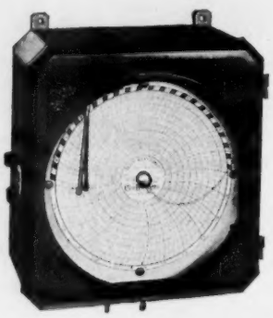
Hunt automatic hose valve reduces water consumption

connection and a built-in and replaceable valve. By simply taking the hose in hand the valve is released automatically, giving a free flow of water. When the hose is returned to its normal position, as hanging from an overhead washer or placed on the floor, water pressure immediately closes the valve, resulting in an instant and positive shut-off of all water flow.

♦ ♦ ♦

Draft Recorders—

Hays Corp., Michigan City, Ind., recently brought out a new line of series "OT" draft recorders, shown herewith. The various indicating mechanisms used in the company's



Hays "OT" draft recorder for draft, pressure, temperature

pointer gages can be employed in these new units. Ten-inch diameter charts provide 3⅛ inches of pen travel.

Three sizes of slack leather diaphragm members are used in these recorders for various ranges of draft, pressure and differential 0 to 0.5 inch water to 100 inches water. The series "OT" units are designed for application in stationary boiler rooms, factories, in mines in connection with ventilation, in by-product coke ovens and in steel mills to accurately record important pressure and suction changes. The recorders are offered in dust-tight cases which can be supplied with lugs for wall mounting; flange for flush mounting.

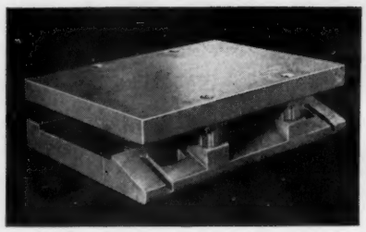
♦ ♦ ♦

All-Steel Die Sets—

Danly Machine Specialties Inc., Chicago, is announcing a new line of all-steel die sets, shown herewith, produced by torch cut and weld methods. The fact that the company's special die sets found a wide field of use led to the study and development of a standard line of all-steel shoes and punch holders.

Eight types were selected as most useful to industry and a series of standard sizes developed covering a wide spread of dimensions. Complete plate stocks are carried in all thicknesses from 1 to 6½ inches.

In the demountable boss set the boss replaces the usual bushing and



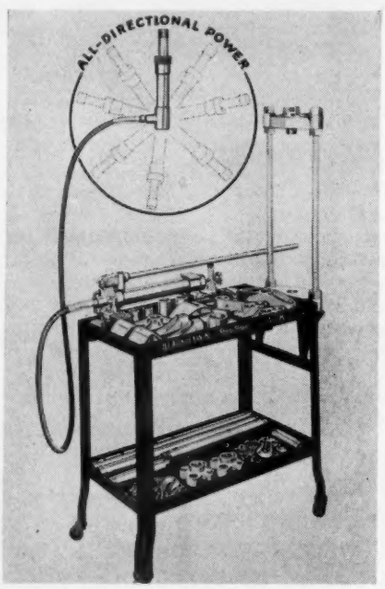
Danly all-steel die set produced by torch cut and weld methods

is regularly held to the shoe or punch holder by four socket head cap screws. Combination No. 1 is intended for heavy duty work requiring unusually rigid support, accessibility and ease of changing dies. Combination No. 2 is an alternate. In this type, the guide posts pressed in the die holder is recommended for use where the shut height of the punch press is limited. These sets are made in both 2 and 4-pin series, in all sizes from 10 x 30 inches to 30 x 100 inches for the 2-pin series, and 10 x 30 to 50 x 100 inches for the 4-pin series.

♦ ♦ ♦

Hydraulic Jack—

Blackhawk Mfg. Co., Milwaukee, recently introduced a hydraulic jack which involves a unique idea in separation of the pump and ram into two units connected by a hose. This provides a remote control feature. Power may be applied in all directions, with the ram in any position. With this device, shown herewith, it is possible to pull or press metal into shape, straighten automobile frames and repair body faults under a hydraulic pressure of seven tons. Attachments enable the jack to push, pull, clamp, spread, or straighten.



Ram and pump are separate units in Blackhawk hydraulic jack

Roebling — the custom-made wire for exacting welders

ROEBLING Welding Wire is made by custom-methods . . . of steel produced *specifically* for welding purposes in Roebling's own open-hearth mill. It is absolutely uniform in quality and is free of non-metallic impurities.

We would welcome your request for further information, prices, or samples. Roebling Welding Wire is available in both gas and electric types.

JOHN A. ROEBLING'S SONS CO., TRENTON, N.J.

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ONLY A FINE PRODUCT MAY BEAR THE NAME ROEBLING

Meeting of Open-Hearth Committee

(*Concluded from Page* 48)

checker roofs and the slag pockets to floor level. A 3-inch layer of insulation was applied to the checker roofs and on the fan tail arches. All vertical walls around the slag pockets to the roof had a 2½-inch coat of thermoflake. Nails were driven into the brick and allowed to extend out about 1-inch to serve as a support for the coating. On the roof a 4-inch coating of thermoflake was applied and over this ½-inch of plastic in order to make a better looking job. Savings have been effected, the speaker pointed out, considering the grade of steel now made and that made two years ago.

Reports Fuel Saving

Another superintendent pointed out that a fuel saving amounting to 8¼ per cent resulted from insulating furnaces at his plant. At an Ohio shop where 3-inches of plastic insulation was used below floor level and from 3½ to 4-inches on the roof, the refractory life of the roof was increased 25 per cent. Slag pockets deposits, the speaker stated, are improved in that they do not choke up so quickly when insulation is employed. The time of heats was reduced 4 per cent and a savings of 5 gallons of oil per ton of steel effected by insulating the roof and furnace below floor level.

In another open-hearth shop where five furnaces are insulated with thermoflake the following thicknesses are used: On the checker walls 1½-inches of granular, on the checker roof 2-inches of granular and 1-inch of cement, on the fan tails 3-inches of granular and 1-inch of cement, on the vertical walls 2½-inches of granular and 1½-inches of cement and on the furnace roof 3-inches of granular and 1-inch of cement. The superintendent at this particular plant expects to obtain a fuel saving ranging from 8 to 10 per cent.

Another operator in speaking on insulation presented the following temperatures on a furnace before and after being insulated with 2-inches of thermoflake:

	Before degrees Fahr.	After degrees Fahr.
Air chamber bulkhead	240	185
First panel, bulkhead....	172	115
Second panel bulkhead..	160	116
Third panel, bulkhead....	181	138
Roof of checkers	182	165

A furnace in the Chicago district recently was insulated with a 4½-inch course of silocel around the checker chamber and on all vertical walls up to the floor and the whole encased in steel. Asbestos paper, ⅛-inch thick, was applied on the checker chamber roof and this covered with a 3-inch coating of thermoflake. The roof of the furnace is coated with 4½-inches of the latter type insulation. The speaker pointed out that a 1-inch layer of sand may be placed over this insulation to prevent leakage of gas.

William C. Buell, Jr., engineer, Cleveland, advocated the use of insulation on open-hearth furnaces but directed attention to the fact that it is highly essential to know what is underneath insulation as well as the steelmaking practice followed. There is an economic point beyond which the operator should go in the matter of insulation and he warned operators to see that their furnace was in good condition before applying insulation.

On a chrome backwall one operator mentioned that he used kromag applied with a Quigley gun to a thickness of ½-inch. Cost of maintenance of a straight backwall at one plant is 9 cents per ton compared with 2 to 3 cents per ton for a sloping backwall. At another plant a saving of 5 cents per ton was obtained between sloping and semi-sloping backwalls.

Discussion of furnace bottoms brought out the fact that chrome brick is being used successfully in a few plants. Just short of 400 heats were obtained on a 13½-inch bulkhead built with metalkase brick were obtained at one plant using producer gas as fuel.

Consumption of bottom making refractories per ton of steel shows a wide variation at different plants. One operator averages 47 pounds of single burnt dolomite and 55 pounds of double burned per ton of metal. At another plant 40 pounds of burned syndolag and 90 pounds of raw dolomite are used per ton of steel. An Ohio plant uses 30 pounds of double burned dolomite and 60 pounds of raw dolomite per ton of steel; at another shop 40 and 115 pounds respectively are employed.

More than 100 open-hearth operators visited the plant of the Andrews Steel Co., Newport, Ky., Wednesday evening. Thursday afternoon approximately 150 operators and guests inspected the open-hearth shop and continuous sheet mill of the American Rolling Mill Co., Middletown, O. The conference closed with a dinner at Hotel Manchester there.

# Indicates and Records Rolling Loads

(*Concluded from Page* 45)

nage is increased and quality improved.

In a multiple stand mill it is common practice to overload one or two stands and operate the other stands at much smaller loads. Using pressure blocks on all the stands provides means by which the control man can know what pressures are being used and can more nearly equalize the load among the several stands. This results in fewer breakdowns and large savings in operation and maintenance expense.

Use of pressure blocks to determine the correct pressure for the "skin-pass" and to maintain that pressure in production has been made by one of the large producers of sheet of this type. The results have been so highly satisfactory that its rolling equipment for this purpose is being equipped with pressure blocks.

As has been explained, it has been found that there is a limit to the pressure that can be used with efficiency in the rolling mill and avoid excessive maintenance costs. This correct rolling pressure is the load that will require the most efficient use of power in driving the mill. When too high pressures are used, one not only runs the risk of bearing failures, roll spalling, broken necks, etc., but wastes the increased power that must be used in operating the mill at too high pressure.

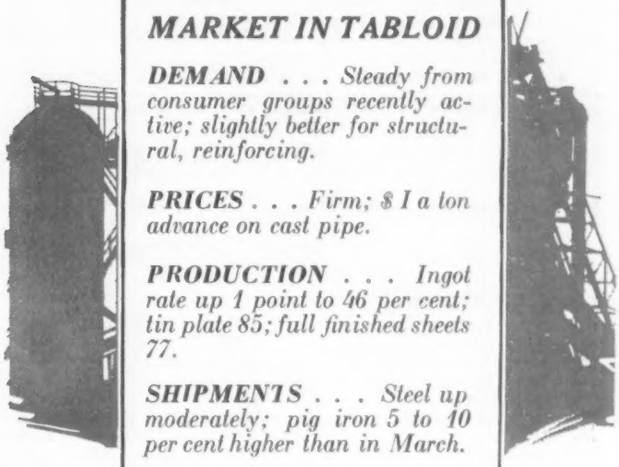
The foregoing indicates ways in which the operating costs of a rolling mill can be reduced by the intelligent use of pressure blocks. These savings will pay for the blocks many times during the life of the mill. For example, a 6-stand mill may produce 400,000 tons per year. The roller bearings on the mill cost about $90,000. The average life of the bearings is 400,000 tons of rolled material. Suppose broken rolls, lost time, etc., cost as much as bearings, then these maintenance expenses total at least $180,000 per year. A saving of only 25 per cent of this amount means $45,000 saved per year—a sum which would provide pressure blocks for each stand.

Another important feature entirely aside from the saving that can be made is the fact that the mill will be equipped with instruments that provide means for its more intelligent operation. This will make it easy for engineers and mill operators to determine the proper working conditions.

Power studies can be made easily, the proper design and size of mill can be determined intelligently more lasting bearings and rolls can be developed and mills can be rated properly.

Steel Rate Again Rises; Better Market Tone

Iron, Steel Specifications Improved Over March; Freight Rates in Tangle



MARKET IN TABLOID

DEMAND *. . . Steady from consumer groups recently active; slightly better for structural, reinforcing.*

PRICES *. . . Firm; $1 a ton advance on cast pipe.*

PRODUCTION *. . . Ingot rate up 1 point to 46 per cent; tin plate 85; full finished sheets 77.*

SHIPMENTS *. . . Steel up moderately; pig iron 5 to 10 per cent higher than in March.*

SUSTAINED demand for iron and steel, with no bulge in any consumer classification, but gains in moderate-size miscellaneous orders, has infused a little more confidence in the markets, and last week lifted steelworks operations another point to 46 per cent.

Steel specifications at Pittsburgh and some other centers so far in April are heavier than in the comparable period last month, notwithstanding the slightly slower general operating rate which followed on the mills catching up with earlier commitments. Pig iron shipments are 5 to 10 per cent larger than in March, best since last June.

Automobile assemblies for the week increased 1000 units to 110,000, accompanied by a slight rise in manufacturers' steel releases. Instead of tapering, as usual at this time, agricultural implement requirements are steady, while orders for farm fencing now are in greatest volume since 1930. Tin plate production continues at 85 per cent.

No indications of a letdown in the next few weeks are apparent, but what ensues in the latter part of this quarter depends largely on how quickly the government's work relief program can be transmitted into steel orders. For some months, since the President proposed a considerable expenditure for grade eliminations, railroads have prepared plans, now ready for immediate approval, and it is believed considerable of the 2,000,000 tons of estimated steel requirements will be released in May or June.

Failure of some industrial states to ratify, short of 30 days notice for intrastate commerce, the rate surcharges effective April 18 on interstate traffic is reacting for the present to benefit consumers who can buy from basing points in their own states, but has tended to restrict competition between states.

Producers in one state attempting to sell in another must absorb more freight, which now amounts to as much as $2.70 a ton on finished steel, making it almost impossible for them to compete. In a few instances where there is no basing point within a state for certain products, producers in that state are actually receiving a higher mill price than before, because there is no state surcharge to allow the consumer as an offset against a higher interstate rate.

It is obvious in the industry that only steel code restrictions are standing in the way of a general price adjustment. Cast pipe, unfettered by the code, has been advanced $1 a ton at Birmingham, $1.40, Chicago.

Railroad steel buying is not offsetting the freight rise. Only occasional orders are placed Missouri Pacific purchased 9000 tons of rails, 8000 tons of accessories. Akron, Canton & Youngstown is seeking a federal loan to buy 7212 tons of rails and accessories.

Structural shape awards for the week amounted to 12,460 tons, reinforcing bar orders 20,495 tons, including 4600 tons of shapes and 11,000 tons of bars for the Fort Peck, Montana, dam, and 6200 tons of bars for the Stickney, Ill., disposal plant. Los Angeles water district placed 3500 tons of plates. At New York, $10,000,000 worth of oil refinery work requiring a large plate tonnage is pending.

Ford's inquiry for 180,000 tons of iron ore is expected to develop a price shortly. To supplement its own pig iron output, it has been inquiring for 10,000 tons of foundry iron.

Pittsburgh steelworks operations last week were up 2 points to 36 per cent; Youngstown 3 to 58; Buffalo 3 to 37. Cleveland was down 2 to 62; Chicago ½-point to 50, others unchanged.

STEEL's iron and steel price composite has advanced 4 cents to $32.31, due to cast pipe; finished steel index remains $54, while the scrap composite is down 4 cents to $10.

COMPOSITE MARKET AVERAGES

	April 20	April 13	April 6	One Month Ago Mar., 1935	Three Months Ago Jan., 1935	One Year Ago Apr., 1934	Five Years Ago Apr., 1930
Iron and Steel	$32.31	$32.27	$32.27	$32.46	$32.58	$32.67	$34.16
Finished Steel	54.00	54.00	54.00	54.00	54.00	53.90	53.66
Steelworks Scrap	10.00	10.04	10.25	10.75	12.03	12.15	14.08

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	April 20, 1935	Mar., 1935	Jan., 1935	April, 1934
Steel bars, Pittsburgh	1.80c	1.80c	1.80c	1.85c
Steel bars, Chicago	1.85	1.85	1.85	1.90
Steel bars, Philadelphia	2.09	2.09	2.09	2.15¼
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.60
Shapes, Pittsburgh	1.80	1.80	1.80	1.80
Shapes, Philadelphia	2.00½	2.00½	2.00½	2.01¾
Shapes, Chicago	1.85	1.85	1.85	1.85
Tank plates, Pittsburgh	1.80	1.80	1.80	1.80
Tank plates, Philadelphia	1.98½	1.98½	1.98½	1.99¾
Tank plates, Chicago	1.85	1.85	1.85	1.85
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	1.90
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.50
Sheets, No. 24, galvan., Pitts.	3.10	3.10	3.10	3.10
Sheets, No. 10, hot rolled, Gary	1.95	1.95	1.95	2.05
Sheets, No. 24, hot anneal., Gary	2.55	2.55	2.55	2.65
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	3.25
Plain wire, Pittsburgh	2.30	2.30	2.30	2.25
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pittsburgh	2.60	2.60	2.60	2.50

Semifinished Material

Sheet bars, open-hearth, Youngs.	$28.00	$28.00	$28.00	$28.40
Sheet bars, open-hearth, Pitts.	28.00	28.00	28.00	28.40
Billets, open-hearth, Pittsburgh	27.00	27.00	27.00	27.80
Wire rods, Pittsburgh	38.00	38.00	38.00	37.20

Pig Iron

Bessemer, del. Pittsburgh	$19.76	$19.76	$19.76	$19.56
Basic, Valley	18.00	18.00	18.00	17.60
Basic, eastern, del. eastern Pa.	19.76	19.76	19.76	19.51
No. 2, foundry, del. Pittsburgh	19.26	19.26	19.26	19.06
No. 2 foundry, Chicago	18.50	18.50	18.50	18.25
Southern No. 2, Birmingham	14.50	14.50	14.50	14.25
No. 2X eastern, del. Philadelphia	20.63	20.63	20.63	20.38
Malleable, Valley	18.50	18.50	18.50	18.10
Malleable, Chicago	18.50	18.50	18.50	18.25
Lake Superior charcoal, del. Chi.	24.25	24.04	24.04	23.66
Ferromanganese, del. Pittsburgh	89.79	89.79	89.79	90.24
Gray forge, del. Pittsburgh	18.63	18.63	18.63	18.68

Scrap

Heavy melting steel, Pittsburgh	$11.50	$12.40	$13.50	$14.15
Heavy melt. steel, No. 2, east. Pa.	9.25	9.15	9.70	9.50
Heavy melting steel, Chicago	10.00	10.50	12.15	11.75
Rails for rolling, Chicago	11.00	11.65	12.90	12.75
Railroad steel specialties, Chicago	11.25	11.65	13.40	12.75

Coke

Connellsville, furnace, ovens	$3.60	$3.60	$3.60	$3.30
Connellsville, foundry, ovens	4.60	4.60	4.60	4.55
Chicago, by-product foundry, del.	9.25	9.25	9.25	9.25

Steel, Iron, Raw Material, Fuel and Metals Prices

Prices are code levels filed with American Iron and Steel Institute, 350 Fifth avenue, New York. Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week.

Sheet Steel

Hot Rolled No. 10, 24-48 in.

Pittsburgh	1.85c
Gary	1.95c
Chicago, delivered	1.98c
*New York, del.	2.20c
Philadelphia, del.	2.14c
Birmingham	2.00c
St. Louis, del.	2.17c
Pacific ports, f.o.b. cars, dock	2.40c

Hot Rolled Annealed No. 24

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, delivered	2.60c
*New York, del.	2.75c
Philadelphia, del.	2.69c
Birmingham	2.55c
St. Louis, del.	2.72c
Pacific ports, f.o.b. cars, dock	3.05c

Galvanized No. 24

Pittsburgh	3.10c
Gary	3.20c
Chicago, delivered	3.23c
Philadelphia, del.	3.39c
*New York, del.	3.45c
Birmingham	3.25c
St. Louis, del.	3.42c
Pacific ports, f.o.b. cars, dock	3.70c

Tin Mill Black No. 28

Pittsburgh	2.75c
Gary	2.85c
St. Louis, delivered	3.07c

Cold Rolled No. 10

Pittsburgh	2.50c
Gary	2.60c
Detroit, delivered	2.70c
Philadelphia, del.	2.79c
*New York, del.	2.85c
Pacific ports, f.o.b. cars, dock	3.10c

Cold Rolled No. 20

Pittsburgh	2.95c
Gary	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.24c
*New York, del.	3.30c

Enameling Sheets

Pittsburgh, No. 10	2.50c
Pittsburgh, No. 20	3.10c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base con. (box) Pitts.	$5.25
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.40c
Do., Gary	3.50c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold stp.	20.50	22.00	27.00	35.00

Steel Plates

Pittsburgh	1.80c
*New York, del.	2.0926c
Philadelphia, del.	1.98½c
*Boston, delivered	2.22c
*Buffalo, delivered	2.05145c
Chicago or Gary	1.85c
*Cleveland, del.	1.99795c
Birmingham	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific ports, f.o.b. cars, dock	2.35c
St. Louis, delivered	2.07c

Structural Shapes

Pittsburgh	1.80c
Philadelphia, del.	2.00½c
New York, del.	2.05½c
*Boston, delivered	2.20¼c
Bethlehem	1.90c
Chicago	1.85c
*Cleveland, del.	1.99795c
Buffalo	1.90c
Gulf Ports	2.20c
Birmingham	1.95c
Pacific ports, f.o.b. cars, dock	2.35c

Bars

Soft Steel

Pittsburgh	1.80c
Chicago or Gary	1.85c
Duluth	1.95c
Birmingham	1.95c
Cleveland	1.85c
Buffalo	1.90c
Detroit, delivered	1.95c
Pacific ports, f.o.b. cars, dock	2.35c
Philadelphia, del.	2.09c
*Boston, delivered	2.22c
*New York, del.	2.15c
Pitts., forg. qual.	1.95c-2.05c

Rail Steel

To Manufacturing Trade

Pittsburgh	1.70c
Chicago or Gary	1.75c
Moline, Ill.	1.75c
Cleveland	1.75c
Buffalo	1.80c

Iron

Troy, N. Y.	1.70c
Terre Haute, Ind.	1.75c
Chicago	1.80c
Philadelphia	1.89c
Pittsburgh, refined	2.75-7.50c

Reinforcing

New billet, straight lengths, quoted by distributors.

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. cars dock	2.45c
Philadelphia, del.	2.34c

Rail Steel

Straight lengths quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young.	1.95c
Gulf ports	2.30c

Wire Products

(Prices apply to straight or mixed carloads; pool cars, or less, 15c up. 10% dis. on nail extras on stright or mixed carloads to one consignee.)

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.60
Cement coated nails	2.60
Galvanized nails, 15 gage and coarser	4.60c
do., 16 gage and finer	5.10c

(Per pound)

Polished staples	3.30c
Galvanized fence staples	3.55c
Barbed wire, galv.	3.00c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
Woven wire fencing (base column, c.l.)	$63.00
Plain wire, 6-9 gage to mfg. trade	2.30c

Anderson, Ind., (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pittsburgh or Cleveland	2.90c

Do., Chicago up $1, Worcester, $2.

Cold-Finished Carbon Bars and Shafting

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs	1.95c
20,000 to 59,999 lbs.	1.90c
60,000 to 99,999 lbs.	1.85c
100,000 lbs. and over	1.82½c

Gary, Ind., Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars (Hot)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.45c

Alloy S.A.E.	Alloy Diff.	Alloy S.A.E.	Alloy Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo	0.50
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni.	1.05
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring	base
6100 bars	1.20
6100 spring	0.70
Cr., Ni., Van.	1.50
Carbon Van.	0.95

9250.....Carbon base plus extras

Piling

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Strip and Hoops

Hot strip to 23⅛-in. Pittsburgh	1.85c
Chicago, base	1.95c
Birmingham base	2.00c
Detroit, delivered	2.05c
Phila., delivered	2.14c
*New York, del.	2.20c
Cooperage hoop, Pittsburgh	1.95c
Chicago	2.05c
Cold-rolled strip, Pitts., Cleve.	2.60c
Worcester, Mass.	2.80c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts. 24-45 lbs.	$26.00
50-60 lbs.	$23.00
70-75 lbs.	$20.00
80-85 lbs.	$24.00
100 lbs.	$25.00
Light Rails, billet qual. Pitts., Chi.	$35.00
Do., reroll. qual.	34.00
Angle bars, mills	2.55c
Spikes, R. R. base	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs. up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots, Dec. 1, 1932, lists, 10% extra for less full containers.

Carriage Bolts

All sizes, cut thread	70-10-5 off
Rolled thread, ½ x 6, smaller	70-10-5 off

Machine Bolts

All sizes cut thread lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts stud bolts	70-10-5 off
Tire bolts	60-5 off
Stove bolts, 75 off in pkgs.; 83 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.	
Rolled thread machine, ½ x 6, smaller	70-10-5 off
Step bolts	70-5 off
Elevator bolts	70-5 off

Nuts

S.A.E. semifinished hex.; ½ to ⅞-inch	70-10-5 off
Do., ½ to 1-inch	70-10-5 off
Do., over 1-inch	70-5 off

Hexagon Cap Screws

Milled	85 off
Upset, 1-in., smaller	85 off

Square Head Set Screws

Upset, 1-in., smaller	70-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland.	2.90c
Struc., c. l., Chicago ⅞-in. and smaller, Pitts., Chi., Cleve.	3.00c, 70 and 5 off
Wrought washers, Pitts., Chi., Phila., to jobbers & large nut, bolt mfrs.	$6.25 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more no discount on size extras	$3.05
Do. under 5 kegs; no discount on size extras	$3.20

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

Butt Weld

Steel

In.	Blk.	Gal.
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

Lap Weld

Steel

2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½

Line Pipe

Steel

½, butt weld	57½
⅛-inch, butt weld	50½
¼—⅜, butt weld	52½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63

Iron

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

Boiler Tubes

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 points under base.

Seamless Boiler Tubes

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

*6-in. & over, Birm.	$39.00-40.00
*4-in., Birmingham	42.00-43.00
*4-in., Chicago	50.40-51.40
*6 to 24-in., Chicago	47.40-48.40
6-in. & over, east fdy.	42.00
Do., 4-in.	45.00

Class A pipe $3 over Class B.

Stnd. fitgs., Birm. base...$100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown	$27.00
Philadelphia	32.30
Duluth	31.00
Forging, Pitts., Chi. and Buffalo	32.00
Forging, Duluth	36.00

Sheet Bars

Pitts., Cleve., Young., Chi., Buff., Canton, Sparrows Pt.	28.00

Slabs

Pitts., Cleve., Young.	27.00

Wire Rods

(Common; combination up $2)

Pitts., Cleveland	38.00
Chicago	39.00
Worcester, Mass.	40.00

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Point	1.70c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.60
Connellsville, fdry.	4.60
Connel. prem. fdry.	5.10
New River fdry.	6.00
Wise county fdry.	4.45- 5.25
Wise county fur.	4.00- 4.50

By-Product Foundry

Newark, N. J., del.	9.20- 9.65
Chi., ov., outside del.	8.50
Chicago, del.	9.25
New England, del.	11.00
St. Louis, del.	9.25
Birmingham, ovens	6.00
Indianapolis, del.	8.75
Cincinnati, del.	9.30
Cleveland, del.	9.25
Buffalo, ovens	7.50- 8.00
Detroit ov., out. del.	8.50
Philadelphia, del.	9.00

Coke By-Products

Per gallon, producers' plants.

Tank lots	Spot
Pure and 90% benzol	15.00c
Toluol	30.00c
Solvent naphtha	30.00c
Commercial xylol	30.00c

Per lb. f.o.b. New York.

Phenol (200 lb. drums)	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls.	5.00c

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.20

†Western prices, ½-cent up.

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Birmingham, Ala., southern del...	14.50	14.50	13.50	19.06
Buffalo	18.50	19.00	17.50	19.50
Chicago	18.50	18.50	18.00	19.00
Cleveland	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
Duluth	19.00	19.00	.....	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Everett, Mass.	19.50	20.00	19.00	20.50
Hamilton, O.	18.50	18.50	18.00	19.00
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Sparrows Point, Md.	19.50	.....	19.00	.....
Swedeland, Pa.	19.50	20.00	19.00	20.50
Toledo, O.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
Delivered from Basing Points:				
Akron, O., from Cleveland	19.76	19.76	19.26	20.26
Baltimore from Birmingham	20.02	.....	19.90	.....
Boston from Birmingham	19.62	.....	19.50	.....
Boston from Everett, Mass.	20.00	20.50	19.50	21.00
Boston from Buffalo	20.00	20.50	19.50	21.00
*Brooklyn, N. Y., from Bethlehem	21.93	22.43	.....	.....
*Brooklyn, N. Y., from Bmgham..	21.55	.....	.....	.....
Canton, O., from Cleveland	19.76	19.76	19.26	20.26
Chicago from Birmingham	†18.72	.....	18.60	.....
Cincinnati from Hamilton, O.	19.51	19.51	19.01	.....
*Cincinnati from Birmingham....	19.38	.....	19.40	.....
*Cleveland from Birmingham....	19.04	.....	18.92	.....
*Indianapolis from Hamilton, O..	20.93	20.93	20.43	21.43
Mansfield, O., from Toledo, O.	20.26	20.26	19.76	20.76
*Milwaukee from Chicago	19.57	19.57	19.07	20.07
*Muskegon, Mich., from Chicago, Toledo or Detroit	21.60	21.60	21.10	22.10
*Newark, N. J., from Birmingham	20.61	.....	.....	.....
*Newark, N. J., from Bethlehem..	20.99	21.49	.....	.....
Philadelphia from Birmingham..	19.88	.....	19.76	.....
Philadelphia from Swedeland, Pa.	20.26	20.76	19.76	.....
Pittsburgh district from Neville Island	Neville base plus 63c, 76c and $1.13 switching charges			
Saginaw, Mich., from Detroit	20.60	20.60	20.10	21.10

Delivered from Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	19.00	19.00	18.50	.....
St. Louis from Birmingham	†18.62	.....	18.50	.....
St. Paul from Duluth	20.94	20.94	.....	21.44

†Over 0.70 phos.

Low Phos

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $23.50. Phila. base, standard and copper bearing, $24.63.

Gray Forge		Charcoal	
Valley furnace	18.00	Lake Superior fur.	21.00
Pitts. dist. fur.	18.00	* Do., del. Chicago	24.25

Silvery†

Jackson County, O., base; 6% $22.75; 7—$23.75; 8—$24.75; 9—$25.70; 10—$26.75; 11—$27.75. Buffalo base prices, up $1.25.

Bessemer Ferrosilicon†

Jackson County, O., base; 10%—$27.75; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Refractories

Per 1000 f.o.b. Works

Fire Clay Brick

First Quality.

Pa., Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	45.00
Second Quality	
Pa., Ill., Ky., Md., Mo., Ga., Ala.	40.00
Ohio	
First quality	$40.00-45.00
Intermediary	37.00
Second quality	28.00

Malleable Bung Brick

All bases	50.00

Silica Brick

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	40.00
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk)	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$45.00
Chemically bonded chrome brick	42.50
Magnesite brick	65.00
Chemically bonded magnesite brick	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$18.75-19.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$13.00-14.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
Do., Balti. base	85.00
*Do., del. Pittsburgh	89.99
Spiegeleisen, 19-20% dom. Palmerton, Pa., spot†	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb.	90.00
2% carbon, 95.00; 1%,	105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Ferrotungsten, stand., lb. cont. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont., on analysis	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17,-19% Rockdale, Tenn., basis, 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads, Quan. diff. apply.

Nonferrous Prices

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Chinese Spot, N. Y.	Nickel Cathodes
April 13	9.00	9.12½	7.60	51.30	50.25	3.65	3.50	4.05	*19.00	14.25	35.00
April 15	9.00	9.12½	7.60	51.00	50.25	3.70	3.55	4.05	*19.00	14.25	35.00
April 16	9.00	9.12½	7.60	51.12½	50.35	3.70	3.55	4.05	*19.00	14.25	35.00
April 17	9.00	9.12½	7.60	50.75	49.87½	3.70	3.55	4.10	*19.00	14.25	35.00
April 18	9.00	9.12½	7.60	50.62½	49.75	3.70	3.55	4.10	*19.00	14.25	35.00
April 19	9.00	9.12½	7.60	50.62½	49.75	3.70	3.55	4.10	*19.00	14.25	35.00

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 9.00c *Conn. copper.*

Sheets	
Yellow brass (high)	14.25
Copper, hot rolled	16.00
Lead, cut, to jobbers	7.25
Zinc, 100-lb. base	9.50
Tubes and Pipes	
High yellow brass	16.00
Seamless copper	16.25
Rods	
High yellow brass	12.75
Copper, hot rolled	13.25
Anodes	
Copper, untrimmed	13.75
Wire	
Yellow brass (high)	14.75

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
New York	4.50- 4.75
Cleveland	5.25- 5.50
Chicago	4.50- 4.75
St. Louis	5.00- 5.25
Heavy Copper and Wire	
New York	6.00- 6.25
*Chicago, No. 1	5.75- 6.00
Cleveland	5.75- 6.00
St. Louis	5.50- 5.75
Composition Brass Borings	
New York	4.00- 4.25
Light Copper	
New York	4.75- 5.00
*Chicago	4.25- 4.50
Cleveland	4.75- 5.00
St. Louis	5.00- 5.12½
Light Brass	
Chicago	2.25- 2.50
Cleveland	2.50- 2.75
Lead	
*New York	2.75- 2.87½
Cleveland	2.50- 2.75
Chicago	2.62½-2.87½
St. Louis	2.75- 3.00
Zinc	
*New York	2.00- 2.25
Cleveland	2.00- 2.25
St. Louis	2.25- 2.50
Aluminum	
Borings, Cleveland	8.00- 8.25
Mixed, cast, Clev.	11.75-12.25
Mixed, cast, St. L.	**12.75-13.00**
Clips, soft, Clev.	13.50-13.75

SECONDARY METALS

*Brass ingot, 85-5-5-5	8.00
Stand. No. 12 Alum.	15.75-17.00

Iron and Steel Scrap Prices

Corrected to Friday night Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	8.50- 9.00
Boston, dock, expt.	8.25- 8.50
Boston, domestic	7.00- 7.25
Buffalo, No. 1	10.00-10.50
Buffalo, No. 2	8.00- 8.50
Chicago, No. 1	9.75-10.00
Cleveland, No. 1	9.00- 9.50
Cleveland, No. 2	8.50- 9.00
Detroit, No. 1	7.50- 8.00
Detroit, No. 2	6.50- 7.00
Eastern Pa., No. 1	10.00-10.50
Eastern Pa., No. 2	9.00- 9.50
Federal, Ill.	7.50- 8.00
Granite City, R. R.	8.25- 8.75
Granite City, No. 2	7.00- 7.50
N. Y., deal, No. 2	7.00
N. Y., deal. barge	8.50
Pittsburgh, No. 1	11.25-11.75
Pittsburgh, No. 2	10.00-10.50
St. Louis	7.25- 7.75
Valleys, No. 1	10.50

COMPRESSED SHEETS

Buffalo, dealers	8.00- 8.50
Chicago, factory	8.50- 9.00
Chicago, dealer	7.50- 8.00
Cleveland	8.00- 8.50
Detroit	7.75- 8.25
E. Pa., new mat.	9.50
Pittsburgh	10.75-11.25
St. Louis	7.00- 7.25
Valleys	10.00

BUNDLED SHEETS

Buffalo	6.50- 7.00
Cincinnati, del.	6.00- 6.50
Cleveland	6.00- 6.50
Pittsburgh	9.75-10.25
St. Louis	4.50- 5.00

SHEET CLIPPINGS, LOOSE

Chicago	5.50- 6.00
Cincinnati	5.50- 6.00
Detroit	5.00- 5.50
St. Louis	4.00- 4.50

STEEL RAILS, SHORT

Birmingham	11.50-12.00
Buffalo	11.00-11.50
Chicago (3 ft.)	12.00-12.50
Chicago (2 ft.)	12.50-13.00
Cincinnati, del.	11.00-11.50
Detroit	9.50-10.00
Pitts., open-hearth, 3 ft. and less	14.00-14.50
St. Louis, 2 ft.& less	12.00-12.50

STEEL RAILS, SCRAP

Boston	7.00- 7.25
Chicago	9.75-10.00
Pittsburgh	11.50-12.00
St. Louis	9.00- 9.50

STOVE PLATE

Birmingham	6.00- 6.50
Boston, dealers	3.75- 4.00
Buffalo	9.00- 9.50
Chicago, net	6.00- 6.50
Cincinnati, dealers	5.50- 6.00
Detroit, net	5.75- 6.25
Eastern Pa.	8.00
N. Y., deal. fdry.	6.00
St. Louis	5.50- 6.00

COUPLERS, SPRINGS

Buffalo	12.75-13.25
Chicago, springs	11.00-11.50
Eastern Pa.	13.50
Pittsburgh	14.00-14.50
St. Louis	9.00- 9.50

ANGLE BARS—STEEL

Chicago	11.00-11.50
St. Louis	10.00-10.50

RAILROAD SPECIALTIES

Chicago	11.00-11.50

LOW PHOSPHORUS

Buffalo, billets and bloom crops	12.00-12.50
Cleveland, billet, bloom crops	14.00-14.50
Eastern Pa., crops	13.00-14.00
Pittsburgh, billet, bloom crops	15.00-15.50
Pittsburgh, sheet bar crops	13.50-14.00
Pittsburgh, plate	12.75-13.25

FROGS, SWITCHES

Chicago	9.75-10.00
St. Louis, cut	9.00- 9.50

SHOVELING STEEL

Chicago	9.75-10.00
Federal, Ill.	7.50- 8.00
Granite City, Ill.	7.25- 7.75

RAILROAD WROUGHT

Birmingham	7.00- 7.50
Boston, dealers	6.00- 6.50
Buffalo, No. 1	8.00- 8.50
Buffalo, No. 2	10.00-10.50
Chicago, No. 1, net	8.50- 9.00
Chicago, No. 2	9.75-10.00
Cincinnati, No. 2	7.75- 8.25
Eastern Pa.	10.00-10.50
N. Y., No. 1, deal.	7.25- 7.75
St. Louis, No. 1	6.00- 6.50
St. Louis, No. 2	7.50- 8.00

SPECIFICATION PIPE

Boston	3.00- 3.25
Eastern Pa.	9.00- 9.50
New York, dealers	3.50- 4.00

BUSHELING

Buffalo, No. 1	8.50- 9.00
Chicago, No. 1	8.00- 8.50
Cinci., No. 1, deal.	6.00- 6.50
Cincinnati, No. 2	2.75- 3.25
Cleveland, No. 2	6.00- 6.50
Detroit, No. 1, new	6.50- 7.00
Valleys, new, No. 1	10.00

MACHINE TURNINGS

Birmingham	4.00- 4.50
Boston, dealers	1.00- 1.25
Buffalo	4.50- 5.00
Chicago	5.00- 5.50
Cincinnati, dealers	3.50- 4.00
Cleveland	5.00- 5.50
Detroit	3.50- 4.00
Eastern Pa.	5.50- 6.00
New York, dealers	1.50- 2.00
Pittsburgh	7.50- 8.00
St. Louis	3.00- 3.50
Valleys	7.75- 8.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	3.25- 3.50
Buffalo	5.25- 5.75
Cincinnati, dealers	4.50- 5.00
Cleveland	6.00- 6.50
Detroit	4.50- 5.00
Eastern Pa.	5.00
New York, dealers	1.50- 1.75
Pittsburgh	6.00- 6.50

CAST IRON BORINGS

Birmingham, plain	4.00- 4.50
Boston, chemical	5.50- 6.50
Boston, dealers	3.25- 3.50
Buffalo	5.25- 5.75
Chicago	5.00- 5.50
Cincinnati, dealers	3.50- 4.00
Cleveland	6.50- 7.00
Detroit	4.50- 5.00
E. Pa., chemical	11.00-12.00
New York, dealers	1.50- 1.75
St. Louis	3.00- 3.50

PIPE AND FLUES

Cincinnati, dealers	5.00- 5.50

RAILROAD GRATE BARS

Buffalo	7.00- 7.50
Chicago, net	6.00- 6.50
Cincinnati	4.00- 4.50
Eastern Pa.	8.00
New York, dealers	4.00- 4.50
St. Louis	4.50- 5.00

FORGE FLASHINGS

Boston, dealers	4.50- 5.00
Buffalo	8.50- 9.00
Cleveland	8.00- 8.50
Detroit	6.50- 7.00
Pittsburgh	10.00-10.50

FORGE SCRAP

Boston, dealers	5.00- 5.25
Chicago, heavy	10.50-11.00
Eastern Pa.	9.50-10.00

ARCH BARS, TRANSOMS

St. Louis	9.50-10.00

AXLE TURNINGS

Boston, dealers	3.00- 3.50
Buffalo	7.50- 8.00
Chicago, elec. fur.	9.50-10.00
Cleveland	7.00- 7.50
Eastern Pa.	9.00
St. Louis	6.50- 7.00

STEEL CAR AXLES

Birmingham	12.00-12.50
Boston, ship. point.	10.00-10.50
Buffalo	12.00-12.50
Chicago, net	13.50-14.00
Eastern Pa.	16.00
St. Louis	12.00-12.50

SHAFTING

Boston, ship. point.	11.75-12.00
Eastern Pa.	16.50
New York dealers	12.00-12.50
St. Louis	11.00-11.50

CAR WHEELS

Birmingham	8.00- 9.00
Boston, iron deal.	5.50- 5.75
Buffalo, iron	11.00-11.50
Buffalo, steel	12.00-12.50
Chicago, iron	10.50-11.00
Chicago, rolled steel	10.50-11.00
Cincinnati, iron	8.00- 8.50
Eastern Pa., iron	10.50-11.00
Eastern Pa., steel	13.50
Pittsburgh, iron	12.00-12.50
Pittsburgh, steel	14.00-14.50
St. Louis, iron	7.00- 7.50
St. Louis, steel	9.25- 9.75

NO. 1 CAST SCRAP

Birmingham	8.50- 9.00
Boston, No. 1 mach.	8.50- 9.00
Boston, No. 2	7.50- 8.00
Boston, tex. con.	8.50- 9.00
Buffalo, cupola	10.00-10.25
Buffalo, mach.	10.25-10.75
Chicago, agri. net	8.00- 8.50
Chicago, auto	9.00- 9.50
Chicago, mach. net	9.00- 9.50
Chicago, railr'd net	8.00- 8.50
Cinci., mach. cup	8.50 9.00
Cleveland, cupola	11.50-12.00
Detroit, net	9.50-10.00
Eastern Pa., cupola	11.00-12.00
E. Pa., mixed yard	8.50- 9.50
Pittsburgh, cupola	11.75-12.25
San Francisco, del.	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	8.00- 8.50
St. L., No. 1 mach.	8.50- 9.00

HEAVY CAST

Boston, del.	5.00- 5.50
Buffalo, break.	8.00- 8.50
Cleveland, break.	7.50- 8.00
Detroit, auto, net	9.50-10.00
Detroit, break.	7.00- 7.50
Detroit, auto net	9.50-10.00
Eastern Pa.	10.00-10.50
N. Y., break. deal.	5.00- 5.50
Pittsburgh	10.75-11.25

MALLEABLE

Birmingham, R. R.	8.50- 9.50
Boston, consum.	12.00-12.50
Buffalo	12.00-12.50
Chicago, R. R.	12.50-13.00
Cincinnati, agri. del.	8.25- 8.75
Cleveland, rail	12.00-12.50
Detroit, auto	10.00-10.50
St. Louis, R. R.	9.00- 9.50
Eastern Pa., R. R.	11.00-11.50

RAILS FOR ROLLING

5 feet and over

Birmingham	10.00-10.50
Boston, dealers	8.00- 8.50
Buffalo	9.50-10.00
Chicago	10.75-11.25
Eastern Pa.	12.50-13.00
New York, dealer	7.50- 8.00
St. Louis	10.00-10.50

LOCOMOTIVE TIRES

Chicago (cut)	11.00-11.50
St. Louis, No. 1	9.00- 9.50

LOW PHOS. PUNCHINGS

Buffalo	12.00-12.50
Chicago	11.50-12.00
Eastern Pa.	13.00-14.00
Pittsburgh	13.00-13.50

Iron Ore

Lake Superior Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

Eastern Local Ores

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

Foreign Ore

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.00
No. Afr. low phos.	10.00
Swedish basic, 65%	9.00
Swedish low phos.	10.00
Spanish No. Africa basic, 50 to 60%	9.00
Tungsten, spot, sh. ton unit, duty pd.	$17.75-18.25
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$18.00-19.50

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots.

Caucasian, 52-55%	26.00
So. African, 52%	26.00
So. Afr., 49-51%	24.00
Indian, 58-60%	nominal
Indian, 48-50%	nominal

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	
Baltimore*	2.90c
Boston††	2.95c
Buffalo	3.00c
Chattanooga	3.31c
Chicago	2.95c
Cincinnati	3.17c
Cleveland	2.95c
Detroit	3.03½c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.06c
New Orleans	3.30c
New York‡(d)	3.22c
Pittsburgh(h)	2.90c
Philadelphia*	2.90c
San Francisco	3.60c
Seattle	3.60c
St. Louis	3.19c
St. Paul	3.00c
Tulsa	3.25c
IRON BARS	
Portland	3.40c
Chattanooga	3.31c
Baltimore*	3.00c
Chicago	2.75c
Cincinnati	3.17c
New York‡(d)	3.32c
Philadelphia*	2.90c
St. Louis	3.19c
Tulsa	3.25c
REINFORCING BARS	
Buffalo	2.60c
Chattanooga	3.31c
Chicago	2.10c-2.60c
Cleveland (c)	2.10c
Cincinnati	3.25c
Houston	3.25c
Los Ang., cl.	2.45c
New Orleans	3.50c
Pitts., plain (h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	2.45c
St. Louis	3.24c
Tulsa	3.25c
Young.	2.30c-2.60c
SHAPES	
Baltimore*	2.95c
Boston††	3.17c
Buffalo	3.25c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland	3.31c
Detroit	3.40c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.37c
Philadelphia*	2.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c
PLATES	
Baltimore*	2.95c
Boston††	3.18c
Buffalo	3.37c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland, ¼-in. and over	3.31c
Detroit	3.40c
Detroit, ⅜-in.	3.65 c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.40c
Philadelphia*	2.95c
Phila. floor	4.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c
NO. 10 BLUE	
Baltimore*	3.05c
Boston††	3.25c
Buffalo	3.62c
Chattanooga	3.36c
Chicago	3.05c
Cincinnati	3.22c
Cleveland	3.11c
Det., 8-10 ga.	3.13½c
Houston	3.35c
Los Angeles	3.70c
Milwaukee	3.16c
New Orleans	3.55c
New York	3.27c
Portland	3.75c
Philadelphia*	3.05c
Pittsburgh(h)	2.95c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.29c
St. Paul	3.45c
Tulsa	3.70c
NO. 24 BLACK	
Baltimore*†	3.51c
Boston (g)	3.90c
Buffalo	3.25c
Chattanooga	4.21c
Chicago	3.85c
Cincinnati	4.07c
Cleveland	3.91c
Detroit	3.98½c
Los Angeles	4.35c
Milwaukee	3.96c
New York	3.85c
Philadelphia*†	3.55c
Pitts.** (h)	3.55c
Portland	4.40c
San Francisco	4.40c
Seattle	4.40c
St. Louis	4.09c
St. Paul	3.695c
Tulsa	4.75c
NO. 24 GALV. SHEETS	
Baltimore*†	4.21c
Buffalo	4.00c
Boston (g)	4.60c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.72c
Cleveland	4.61c
Detroit	4.70c
Houston	4.40c
Los Angeles	4.95c
Milwaukee	4.66c
New Orleans	4.95c
New York	4.50c
Philadelphia*†	4.25c
Pitts** (h)	4.15-4.45c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.79c
St. Paul	4.19c
Tulsa	5.10c
BANDS	
Baltimore*	3.15c
Boston††	3.25c
Buffalo	3.42c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.47c
Cleveland	3.36c
Detroit, ⅛-in. and lighter	3.38½c
Houston	3.25c
Los Angeles	4.10c
Milwaukee	3.41c
New Orleans	3.95c
New York(d)	3.52c
Philadelphia	3.15c
Pittsburgh(h)	3.20c
Portland	4.25c
San Francisco	4.25c
Seattle	4.25c
St. Louis	3.54c
St. Paul	3.20c
Tulsa	3.45c
HOOPS	
Baltimore	2.30c
Boston	4.25c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.47c
Det., No. 14 and lighter	3.38½c
Los Angeles	5.85c
Milwaukee	3.41c
New York	3.52c
Philadelphia	3.40c
Pittsburgh(h)	3.70c
Portland	5.60c
San Francisco	6.15c
Seattle	5.60c
St. Louis	3.54c
St. Paul	3.75c
COLD FIN. STEEL	
Baltimore (c)	3.56c
Boston	3.60c-3.85c
Buffalo (h)	3.40c
Chattanooga*	3.91c
Chicago (h)	3.35c
Cincinnati	3.57c
Cleveland (h)	3.35c
Detroit	3.48½c
Los. Ang.(f) (d)	5.70c
Milwaukee	3.46c
New Orleans	4.15c
New York	3.77c-4.27c
Philadelphia	3.58c
Pittsburgh(h)	3.30c
Portland (f)	5.85c
San Fran.(f) (d)	5.80c
Seattle (f) (d)	5.85c
St. Louis	3.59c
St. Paul	3.05c
Tulsa	4.50c
COLD ROLLED STRIP	
Boston, 0.100-in., 500 lb. lots	5.35c
Buffalo	3.39c
Chicago	3.27c
Cincinnati (b)	3.44c
Cleveland (b)	3.20c
Detroit	3.33c
New York	4.70c
St. Louis	3.36c

TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up)

	Base
High speed	57c
High carbon, high chrome	37c
Oil hardening	22c
Special tool	20c
Extra tool	17c
Regular tool	14c

Uniform extras apply

BOLTS AND NUTS

(100 pounds or over)

	Discount
Chicago (a)	70
Cleveland	70
Detroit	70
Milwaukee	70
Pittsburgh	70

(a) Under 100 pounds, 65 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Minus quant. diff.; (e) New mill classif.; (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less.

‡Domestic bars; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; †New extras apply; ††Base 40,000 lbs., extras on less.

Prices on heavier lines are subject to new quantity differentials; 399 lbs. and less, up 50 cts.; 400 to 9999 lbs., base; 10,000 to 19,999 lbs., 15 cts. under; 20,000 to 39,999 lbs., 25 cts. under; 40,000 lbs. and over, 35 cts. under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, April 18

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
PIG IRON			
Foundry, 2.50-3.00 Silicon	$15.16 3 2 6	$13.99	1 14 0
Basic bessemer	15.16 3 2 6*	12.67	1 12 0
Hematite, Phos. .03-.05	14.79 3 1 0	.....	.....
SEMIFINISHED STEEL			
Billets	$26.68 5 10 0	$19.33	2 7 0
Wire rods, No. 5 gage	41.23 8 10 0	37.04	4 10 0
FINISHED STEEL			
Standard rails	$37.59 7 15 0	$45.88	5 10 0
Merchant bars	1.63c 7 10 0	1.17c to 1.22c	3 2 6 to 3 5 0
Structural shapes	1.60c 7 7 6	1.15c	3 1 6
Plates, †¼ in. or 5 mm.	1.74c 8 0 0	1.54c	4 2 6
Sheets, black, 24 gage or 0.5 mm.	2.01c 9 5 0	2.16c	5 16 0††
Sheets, gal., 24 gage, corr.	2.44c 11 5 0	3.26c	8 15 0
Bands and strips	1.84c 8 10 0	1.49c	4 0 0
Plain wire, base	2.01c 9 5 0	1.99c	5 7 6
Galvanized wire, base	2.44c 11 5 0	2.33c to 2.37c	6 5 6 to 6 7 6
Wire nails, base	2.60c 12 0 0	2.15c	5 15 0
Tin plate, box 108 lbs.	$ 4.34 0 18 2	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d	French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$16.37 3 7 6(a)	$17.13	260	$10.51	310	$25.38 63
Basic bessemer pig iron	16.37 3 7 6(a)*	12.19	185	9.49	280	28.00 (b) 69.50
Furnace coke	4.00 0 16 6	7.91	120	3.73	110	7.66 19
Billets	26.68 5 10 0	28.34	430	14.92	440	38.88 96.50
Standard rails	1.79c 8 5 0	2.08c	694	1.65c	1,100	2.42c 132
Merchant bars	1.87c 8 12 0	1.68c	560	.83c	550	2.01c 110
Structural shapes	1.90c 8 15 0	1.65c	550	.83c	550	1.97c 107.50
Plates, †¼-in. or 5 mm.	1.97c 9 1 3	2.10c	700	1.05c	700	2.32c 127
Sheets, black	2.28c 10 10 0§	2.55c	850‡	1.16c	775‡	2.64c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.82c 13 0 0	4.05c	1,350	2.25c	1,500	6.77c 370
Plain wire	2.01c 9 5 0	3.39c	1,130	1.65c	1,100	3.17c 173
Bands and strips	2.03c 9 7 0	1.95c	650	1.05c	700	2.32c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel a del. Middlesbrough. b hematite. ††Close annealed

**Gold pound sterling carries a premium of 69 per cent over paper sterling.

Bars

Bar Prices, Page 54

Cleveland — Specifications from manufacturers of agricultural machinery and utensils continue at a steady rate, notwithstanding that usually this is the time when demand from these sources taper off. From builders of road machinery, purchases also are in substantial volume, and releases from automobile manufacturers and forge shops are well sustained. Total volume during the week was slightly above that of the preceding week. The Ohio public utilities commission's refusal to authorize a railroad rate increase corresponding to the interstate advance which went in effect April 18, except on 30 days' notice, virtually prohibits outside mills from selling in some Ohio districts temporarily. For example, rates from Cleveland to Ohio points are unchanged, while some Pennsylvania producers must absorb an additional 31.5 cents per net ton, or a total of $2.70, this actually applying to Canton, O.

Pittsburgh—Heavy retail demand for agricultural and other farm implements continues to account indirectly for much of the present merchant bar shipments. Automotive requirements are also a chief market support and considerable tonnage is moving to the so-called miscellaneous groups. The 1.80c, Pittsburgh market holds steady, but serious consideration is being given to an advance for third quarter in view of application in the interim of freight rate surcharges. Alloy steel bars remain quoted 2.45c, Pittsburgh.

Chicago—Steel bar demand has been aided by heavier automotive orders which lately have increased the total volume rather markedly. Requirements of farm implement manufacturers continue steady, while orders from road machinery builders have increased, as such manufacturers are experiencing full operations in some instances. Bar specifications from miscellaneous consumers are well maintained.

Boston—Forging bars are fairly active as leading shops continue busy with backlogs somewhat reduced. Alloy bar buying is steady, but commercial steel bars are spotty. Carbon steel bars are 2.22c, Boston.

Philadelphia — Commercial steel bar tonnage continues to reflect the disposition of consumers to hold off in anticipation of lower prices. This prospect is not as bright as it was when cold finishers announced a $3 reduction it is still a sufficiently important consideration to have a depressing influence. As the Pennsylvania public service commission has not put into effect an increase in intrastate freight rates, the delivered price here continues at 2.09c, Philadelphia.

Plates

Plate Prices, Page 54

Pittsburgh—An inquiry for 1000 tons of plates appeared last week with the advertisement for bids April 26 to the Vicksburg, Miss., engineers' office on seventy-one 48 x 18 x 3-foot steel pontoons. Bids for construction of a 60 x 40 x 5-foot whirler derrick boat hull will be taken by army engineers at Memphis, Tenn., April 19. Although American Barge Lines, Pittsburgh, does not have immediate plans to purchase the four 175 x 40 x 11-foot barges in which it plans to haul cotton and oil, it bought eighteeen 14½-foot diameter demountable tanks last week from McClintic-Marshall Corp., Bethlehem, Pa., for use on three existing open barges to test the feasibility of this type of hauling. These 18 tanks, each 40 feet in length, requires about 390 tons of plates.

Cleveland—Pending an increase in Ohio intrastate railroad freight rates in line with the interstate advance, plate producers here in some instances will actually receive more for their product in carlots than before the interstate surcharge went in effect April 18. The Ohio public utilities commission will not authorize a rise short of a 30-day statutory notice. Cleveland is not a base for plates, and they are sold in Ohio on a Pittsburgh base. The Pittsburgh base price, plus freight and the new surcharge brings the price to a consumer in Canton, O., to 1.9765c per pound. The Cleveland producer allows a drawback, equivalent to the amount of the freight from Cleveland to the consumer, and there is for the present no increase in this allowance. The difference is 22 cents a ton in the producers' favor. Plate demand, however, is light. Action on many inquiries for small amounts recently quoted by sellers still are hanging fire.

Chicago—Railroad plate releases are small, showing little improvement over the slow rate prevailing so far this year. Construction work and miscellaneous consumers provide best outlets. Industrial tank work continues to require only moderate lots, though some tonnages are moving for construction work in the oil industry.

Boston—Scarcity of tonnage projects restricts plate demand to miscellaneous small lots with railroads buying little. A standpipe at Hinsdale, N. H., 100 tons, has been awarded. Ship repair work has been slightly more active. Plates are 2.22c, Boston.

New York—Substantial plate tonnages for oil company work are expected at any moment. The trade estimates at least $10,000,000 in refinery work is pending here for domestic and foreign installation. Alco Products Co., New York, has awarded 1350 tons of plates for a pipe job in Queens borough, New York, to a Pittsburgh mill. American Rolling Mill Co., Middletown, O., is reliably reported to have booked 600 tons of steel pipe up to 20 inches in diameter for Palmyra, N. Y.

Philadelphia—Plate demand is spotty, with principal attention focussed on the Sun Shipbuilding Co., Chester, Pa. This shipbuilder is generally understood to have received the contract for two tankers for the Gulf Refining Co., New York, for which a substantial tonnage of plates will be required, and in addition is figuring on possibly 300 tons for the Erie ferryboat, a relatively small tonnage for repairs to a dredge for the American Dredging Co., Philadelphia, and plates for a disabled coastwise passenger ship which recently has been towed into dry dock. A small tonnage of fabricated pipe is expected to be placed shortly by the Dravo-Doyle Co., Pittsburgh, for the municipal East Park pumping station here. Railroad and building requirements continue negligible. The Pennsylvania state commission has not made effective the proposed increase in intrastate freight rate surcharges; hence the local delivered price is unchanged at 1.98½c, Philadelphia.

San Francisco—Southwest Welding & Mfg. Co. Inc., Alhambra, Calif., secured 3500 tons of 32-inch welded steel pipe for the metropolitan water district, Los Angeles. Pending business includes 310 tons for 24 and 30-inch welded pipe for the east bay municipal utility district, Oakland, Calif., and 245 tons for the Crystal Springs pipe line tunnels, San Francisco.

Seattle—Tacoma has not yet issued a call for bids for a water line extension to require 1800 tons, but the project is expected to develop soon. Seattle Boiler Works has the contract for two boilers for Alaska fish canneries and also for an incinerator at Wenatchee, Wash., taking less than 100 tons. Reclamation bureau, Ogden, Utah, will receive bids May 2 for 100,000 metal bands and shoes for a wood-stave pipe contract. The same department at Ontario, Oreg., will receive tenders for a quantity of 14 to 48-inch corrugated metal pipe.

Contracts Placed

3500 tons, 32-inch welded steel pipe, specification 1641, metropolitan water dis-

trict, Los Angeles, to Southwest Welding & Mfg. Co., Los Angeles.
1350 tons, Alco Products Co., New York, for pipe work in Queens borough, New York, to unstated Pittsburgh mill.
390 tons, 18 demountable tanks, each approximately 14 x 40 feet, for use on three open barges for American Barge lines, Pittsburgh, to McClintic-Marshall Corp., Bethlehem, Pa.

Contracts Pending

308 tons, 24 and 30-inch welded pipe, Oakland, Calif.; bids opened.
200 tons, tanks, Fleischmann Malting Co., Chicago.

Sheets

Sheet Prices, Page 54

Pittsburgh—The market is strongly supported by specifications from miscellaneous consumers and several makers of washing machine tubs, stoves and electric refrigerators. Commitments by automotive buyers, while improving, have not been so large as in late January. With the exception of the recent reduction in galvanized roofing to jobbers, there has been no change in sheet prices. Operations in the industry were fairly steady last week, with full-finished capacity at 77 per cent, common black sheets at 70 per cent, galvanized at 52 per cent, and jobbing mills at 47 per cent.

Cleveland—Specifications from the automobile industry are being received in a little better volume, continuing mill operations in northern Ohio at 75 to 90 per cent. Ford has released some substantial tonnages. Makers look for a better volume in early May. Refrigerator and washing machine manufacturers' requirements also are holding up, but activity at stove plants is diminishing, with few new orders from that source.

Chicago—Moderately better demand from the automotive industry and well-sustained requirements of a number of miscellaneous consumers gives a fairly even trend to sheet activity here. Mill operations are steady, though backlogs of cold-rolled material have been reduced since last quarter. Prices for Chicago delivery of sheets are unchanged, not being affected by the emergency freight surcharge.

Boston—Demand for sheets is slower. While industrial buying is steady, jobbers are taking shipments sparingly, with galvanized sheets adversely affected by subnormal building operations.

Philadelphia—Sheet tonnage continues to hold up better than most other major products, although trading is far from brisk. In an effort to clarify question of deep-drawing extras, the compliance committee of the steel code authority has issued a ruling interpreted as indicating that whenever a producer is expected to assume the hazard for drawing or any other operation where the surface of the sheet is disturbed, the drawing extra must be charged.

As the Pennsylvania public service commission has not put the proposed emergency surcharges into effect on intrastate movements, the delivered prices on sheets here continue, temporarily at least, unchanged, as Pittsburgh is the basing point.

New York—Sheet tonnage is off here, general buying now the quietest in several weeks. Delivered prices here have been advanced 2 cents per 100 pounds by the increase in freight rates.

Cincinnati—District sheet mills are maintaining rolling schedules close to 75 per cent, with steady demand from refrigerator, stovemakers and miscellaneous users. Automotive buying remains restricted, but need for rush shipments indicates low stocks.

Birmingham, Ala.—All sheet mills are operating, some on full time. Production has been steady and shipments almost equal to output.

Transportation

Track Material Prices, Page 55

Occasional relatively small lots of rails are coming out, but the greater part of the year's requirements appears to have been placed. Missouri Pacific is reported to have divided 9000 tons among four producers and to have distributed 8000 tons of fastenings. PWA has approved allotment of $1,000,000 to the Erie for purchase of about 15,000 tons of rails and sufficient fastenings. An inquiry will be issued as soon as the interstate commerce commission approves the loan.

Akron, Canton & Youngstown railroad, Cleveland, may enter the market soon for 7212 tons of 90-pound rails, 2000 kegs of spikes and 20,000 tie plates, to replace a 51-mile section of the Northern Ohio railway, a subsidiary. A bondholders' committee has applied for federal court permission to borrow $380,000 from the PWA, action on which is expected shortly.

Polson Logging Co., Hoquiam, Wash., has begun construction of an 8-mile logging railroad extension into the upper Wishkah river valley, Olympic penninsula, Washington. Reclamation bureau, Denver, opened bids April 18, for one 180-ton transfer car for the Boulder dam project.

Possibilities of the building of a large number of light streamlined passenger trains are seen in the proposal of the Edward G. Budd Mfg. Co., Philadelphia, to establish a new company to rent trains similar to the Zephyr. The plan would provide for gradual purchase of the equipment through savings in operating costs. Chicago Surface Lines are considering purchase of 100 new street cars to cost about $2,000,000. These are expected to be similar to sample cars built a short time ago for that city by Pullman-Standard Car Mfg. Co., Chicago, and J. G. Brill Co., Philadelphia.

Canadian National railways proposes scrapping $23,000,000 worth of rolling stock, including 220 locomotives. In addition, a bill has been introduced in the Canadian parliament guaranteeing an $8,000,000 loan to the Canadian National railways and a $7,000,000 loan to the Canadian Pacific railways for new rolling stock expenditures.

Construction of a steel bridge, 16,950 feet of trackage and a 750-foot tunnel will be bid soon to the Zanesville, O., army engineers in connection with relocation of the Pennsylvania's right-of-way in the Wills Creek reservoir district, part of the Muskingum conservancy district project in Ohio.

New York Central is distributing steel on which Clayton act bids were taken several weeks ago.

Locomotives Placed

Navy, Washington, two 300-horsepower diesel electric switch engines to American Locomotive Co., New York; to be equipped with McIntosh & Seymour engines.
National Railways of Mexico, five locomotives, to Baldwin Locomotive Co., Philadelphia.

Rail Orders Placed

Missouri Pacific, 9000 tons to four unstated interests, and 8000 tons of track accessories.

Car Orders Pending

Chicago Surface Lines, 100 street cars to cost about $2,000,000.
Key System Ltd., Oakland, Calif., 40 articulated two-car units and 14 extra single bodies; bids asked.

Buses Placed

American Locomotive Co., New York, one 36-passenger capacity bus, for Norfolk Southern Bus Corp., Norfolk, Va.
White Motor Co., Cleveland; two highway coaches for Blue Way Inc., Hartford, Conn.

Cold Finished

Cold Finished Prices, Page 55

Pittsburgh—Plans are being revived for possible revisions in the

method of quoting cold finished steel bars, arising chiefly out of the recent $3 a ton reduction. If cold-drawn bar prices were established at a set differential over hot-rolled bars and certain proposed extra charges were adopted, among other benefits which would accrue would be a closer tie-up between cold-drawn bars and sized hot-rolled bars. Meanwhile, the cold-drawn bar market is recovering somewhat from the absence of buying a few weeks ago when prices were reduced, although April will not equal March. The Pittsburgh base of 1.95c holds steady and unchanged, with Cleveland or Gary quoted 2.00c, and Buffalo, 2.05c. The Detroit market is quoted 2.15c, with Eastern Michigan, 2.20c. Cold-drawn alloy steel bars are quoted at 2.95c, all basing points.

Pipe

Pipe Prices, Page 55

Pittsburgh — The possibility of coking bituminous coal from the Illinois fields to supply artificial gas in St. Louis, is being surveyed from the cost standpoint. If conclusions are favorable for such a project, the proposed 26 or 30-inch steel pipeline from Texas to St. Louis for carrying natural gas might be abandoned.

Chicago—Cast iron pipe prices were advanced $1 a ton, effective April 15. With the emergency freight charge, this brings quotations for Chicago delivery $1.40 a ton above previous levels. Four-inch pipe now is $50.40 to $51.40, delivered, with 6 to 24-inch $47.40 to $48.40. Standard fittings are unchanged at $100, Birmingham base. Activity still is relatively quiet, though moderate tonnages are pending. Aurora, Ill., closes bids April 24 on 1100 tons of 12 to 16-inch, while 1000 tons for the Chicago sanitary district remains to be placed. Several hundred tons will be required for a sewage treatment plant at Waukegan, Ill.

Boston—Cast pipe inquiry is heavier with Sterling, Mass., and Hartford, Conn., soon to close on more than 1000 tons. Merchant steel pipe buying is well sustained.

New York—Awards of cast pipe are still below the seasonal level, with inquiry slack. Approximately 800 tons has been placed by Greenwood Lake, N. Y., while a pending drainage project at Island Park, N. Y., will require 490 tons.

Birmingham, Ala.—No change in the production of cast iron pressure pipe is contemplated, resumption of operations three days a week at Anniston, Ala., adding a little to the tonnage accounted for weekly here. New business is spasmodic and in limited tonnages. Quotations remain unchanged.

San Francisco—While demand for cast iron pipe continues exceptionally light, over 7700 tons have been placed so far this year, compared with 3300 tons for the same period last year.

Seattle—No improvement is noted in the cast iron and steel pipe markets. Spokane, Wash., has allocated funds for water system extensions but specifications are not yet out. About $445,000 will be available.

Cast Pipe Placed

800 tons, 10-inch and under, Greenwood Lake, N. Y., to R. D. Wood & Co., Philadelphia.
634 tons, 8 and 12-inch, class 150, Orem, Utah, to unnamed interest.
457 tons, Mountain Home, Idaho, to Water Works Equipment Co., Salt Lake City, Utah.
350 tons, 16-inch, Leominster, Mass., to R. D. Wood & Co., Philadelphia.
273 tons, Enterprise, Utah, to unnamed interest.
118 tons, Tremonton, Utah, to unnamed interest.
100 tons, 6 and 10-inch, class 150, Walnut Park-Mutual Water Co., Huntington Park, Calif., to unnamed interest.

Steel Pipe Placed

Unstated tonnage, Mountain Home, Idaho, to Crane Co., Pocatello, Idaho.

Cast Pipe Pending

1100 tons, 12 to 16-inch, Aurora, Ill.; bids April 24.
500 tons, various sizes, sewage treatment plant, Waukegan, Ill.; bids May 3.
490 tons, 20-inch and under, Island Park, N. Y.; bids April 25.
348 tons, 2 to 6-inch, class 150, Bloomington, Idaho; bids in.
Unstated tonnage, various sizes, filter plant, Racine, Wis.
Unstated tonnage, 12,250 feet of 16-inch, Fox Point, Wis.; bids May 9.

Steel Pipe Pending

330 tons, pipe railing for Southern Pacific-Key System track crossing of San Francisco-Oakland bay bridge, Oakland, Calif.; bids in.
Unstated tonnage, 30-mile pipeline for natural gas, Montcalm and Mecosta counties, Michigan, Petroleum Transportation Co., Muskegon, Mich.; project, to cost about $200,000, awaiting approval of state utilities commission.

Strip Steel

Strip Prices, Page 55

Pittsburgh—Better volume of hot-rolled strip orders last week accounted for an increase in operations by five per cent to 49 per cent of capacity. Cold-rolled strip steel mill operations remain unchanged at 55 to 60 per cent. Most strip buying is for spot shipment and producers are still forced to operate on a three or four-day weekly basis. The 1.85c, base on hot-rolled strip at Pittsburgh, and the 2.60c figure on cold strip, continue firm.

Cleveland—After a brief letdown specifications from automobile manufacturers and partsmakers have picked up, resulting in better mill operations at some northern Ohio plants. Considerable tonnage was released last week for Chevrolet parts.

Chicago—While some improvement is noted in automotive orders for steel strip, buying is less active than 60 to 90 days ago. With consumption well maintained, however, a moderate gain in automotive orders is anticipated, provided assemblies reach the predicted volume during May and June. Stocks of most strip consumers now are in closer adjustment to actual needs than earlier in the year.

Boston—Cold-strip buying is spotty, incoming business being largely small orders which are fairly numerous, holding aggregate volume to the recent rate. Mills have no substantial backlogs and are meeting demand for quick delivery from current production. Hot-rolled strip is sluggish.

New York—Hot-rolled strip prices have been increased 2 cents per 100 pounds, as a result of the advance in freight rate. Trading is less active than a week ago, although at no time recently has business been brisk.

Philadelphia—With Pittsburgh the basing point here on narrow strip, and with no advance as yet in intrastate freight rates, cold-rolled strip continues at 2.89c, delivered, Philadelphia, and hot strip at 2.14c, Philadelphia. When and if the state commission puts the increase into effect on intrastate shipments, the prices will be advanced 2 cents per 100 pounds. Business is spotty.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 55

Many bolt and nut users, although they signed second quarter contracts, have been slow in specifying against blanket obligations at Pittsburgh. There having been some accumulation in these items through late March, the market suffers so far in April. For spot business producers are quoting 70-10-5 off list, and large rivets are 2.90c, Pittsburgh or Cleveland, 3.00c, Chicago, with small rivetc, 70-5 off list. The current quotation on wrought washers to jobbers and large users is 6.25 off, Pittsburgh.

Demand is light at Chicago, smaller needs of railroads having an adverse effect. Larger buying by agricultural implement manufacturers is not sufficient as an offset.

Shapes

Structural Shape Prices, Page 54

New York—Inquiry and awards are restricted mainly to small bridges and public works. March bookings of fabricated structural steel showed a marked upturn, according to the American Institute of Steel Construction. The volume of bookings was slightly under the volume of the month last year, but approximated the average monthly bookings for the first six months of last year. They were 34 per cent larger than the bookings of February, 1935. Shipments during March were 24 per cent larger than shipments for the same month last year.

Twelve municipalities along the New Jersey shore plan a joint appeal to the federal government for shore protection, which may develop a substantial tonnage of steel piling.

Pittsburgh—Fabricators estimate approximately 2,000,000 tons of fabricated structural steel will be required for grade crossing elimination work, funds for which have been approved by the federal administration as part of the work relief bill. On recent general contract bids for 6000 tons of fabricated structural steel, 4000 tons of steel sheet piling, and 410 tons of various rolled and forged metals for dam No. 26 in the Mississippi river at Alton, Ill., Dravo Contracting Co., Pittsburgh, bid $5,494,431, but low bidder was Engineering Construction Corp., New York, at $4,865,716.80. Although the low general contract bid exceeded the engineers' estimate, it is reported that general contract award will be made and subcontract for the steelwork is expected to be placed with American Bridge Co., Pittsburgh.

Cleveland — Engineering departments of the railroads here have complete plans for numerous grade eliminations, and fabricators believe the government will authorize the construction under the public works relief act in May or June, which would bring out a large tonnage of structural shapes. Wheeling & Lake Erie probably will extend the Huron, O., breakwall which it now is building, and will require an additional 500 tons of steel piling. The government has closed on four Cleveland branch postoffices, taking 208 tons. Private construction work is quiet.

Chicago—Structural awards total about 8000 tons, the largest being 4600 tons for the Fort Peck, Mont., dam spillway. Most other awards also are for public projects, one exception being 400 tons for a can factory at Elwood, Ind. Pending and prospective tonnages are fairly large, one of the leading items being 7000 tons for the St. Louis post office on which bids open May 14. A distillery at Louisville involves 1200 tons, while three industrial plants here require 750 tons.

Boston—First of grade crossing elimination projects are expected out shortly, the Massachusetts program being well organized. Awards are light and limited almost entirely to public works. Repairs to the army

Shape Awards Compared

	Tons
Week ended April 20	12,460
Week ended April 13	27,997
Week ended April 6	7,140
This week in 1934	14,600
Weekly average, 1934	16,284
Weekly average, 1935	15,606
Weekly average, March	20,670
Total to date, 1934	279,442
Total to date, 1935	249,696

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base piers, Boston, taking 7500 tons of piling features the demand in New England.

Philadelphia — Structural awards are light, involving only a few lots of 100 tons or over. Fabricators do not look for any marked improvement until government financed work gets under way. With no advance in intrastate freight rates as yet and with Bethlehem, Pa., the basing point on shipments here, the delivered price is unchanged at 2.00½c, Philadelphia.

San Francisco — Little private work is on architects' boards and the outlook for this class of work during the next few months is far from encouraging. Awards in the week aggregated close to 2500 tons, mainly in lots ranging from 100 to 200 tons.

Seattle—The week's awards were in less than 100-ton lots. New projects of importance are developing slowly. Sather & Sons, Seattle, have the contract at $38,784 for a state girder undercrossing at Tenino, Wash., requiring 140 tons.

Shape Contracts Placed

4600 tons, Fort Peck dam spillway, Wiota, Mont., to R. C. Mahon Co., Detroit; Addison Miller Inc., and Fielding & Shepley Inc., St. Paul, general contractors.

750 tons, tainter gates, Beardsley, Ariz., to Mississippi Valley Structrual Steel Co., Decatur, Ill.

550 tons, piling, federal breakwater, St. Andrews bay, Florida, to Inland Steel Co., Chicago.

500 tons, flume bridges, Beardsley, Ariz., to Consolidated Steel Corp., Los Angeles, Calif.

500 tons, bridge, New York Central railroad, Utica, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.

400 tons, plant building, Continental Can Co., Elwood, Ind., to Austin Co., Cleveland.

400 tons, bridge, Cherokee, Okla., to Patterson Steel Co., Tulsa, Okla.

340 tons, two state bridges, Feather River, Plumas county, California, to unnamed interest.

310 tons, bridge, Bronx, N. Y., to National Bridge Co., Long Island City, N. Y., with Phoenix Bridge Co., Phoenixville, Pa., to fabricate.

285 tons, building, Trinity college, Hartford, Conn., to Ingalls Iron Works Co., Verona, Pa.; through A. F. Peaslee Inc.

270 tons, nurses' home, St. Mary's hospital, Philadelphia, to Belmont Iron Works, Eddystone, Pa.

267 tons, state bridges, Iowa; 144 tons to Pittsburgh-Des Moines Steel Co., Pittsburgh, 65 tons to Clinton Bridge Works, Clinton, Iowa, 58 tons to Des Moines Steel Co., Des Moines Iowa.

250 tons, state bridge, Wareham-Bourne, Mass., to Boston Bridge Works, Cambridge, Mass.; through C. T. Hosmer Co., Greenfield, Mass.

250 tons, public school No. 201, Brooklyn, N. Y., to Bethlehem Fabricators Inc., Bethlehem, Pa.

230 tons, state highway bridge, Jackson county, Arkansas, to Virginia Bridge & Iron Co., Roanoke, Va.

215 tons, Kansas state highway bridge, Morton county, to Benn Sibbitt Iron & Foundry Co., Wichita, Kans.

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210 tons, grade elimination, Fort Wadsworth, Staten Island, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.

208 tons, four Cleveland branch postoffices, to Fort Pitt Bridge Works, Pittsburgh.

200 tons, oil refinery, Wood River, Ill., to Stupp Bros. Bridge & Iron Co., St. Louis.

200 tons, government building, exposition, San Diego, Calif., to Consolidated Steel Corp., Los Angeles.

200 tons, convent, Ferdinand, Ind., to Bedford Foundry & Machine Co., Bedford, Ind.

160 tons, school, Cranston, R. I., to Providence Steel & Iron Co., Providence, R. I.; through Central Engineering & Construction Co., Pawtucket, R. I.

150 tons, school, Putnam Valley, N. Y., to Belmont Iron Works, Philadelphia.

150 tons, piling, breakwater, Milwaukee harbor commission, to Inland Steel Co., Chicago.

140 tons, school, Tupper Lake, N. Y., to Bethlehem Fabricators Inc., Bethlehem, Pa.

140 tons, government store house, Lakehurst, N. J., to Frank M. Weaver Co., Lansdale, Pa.

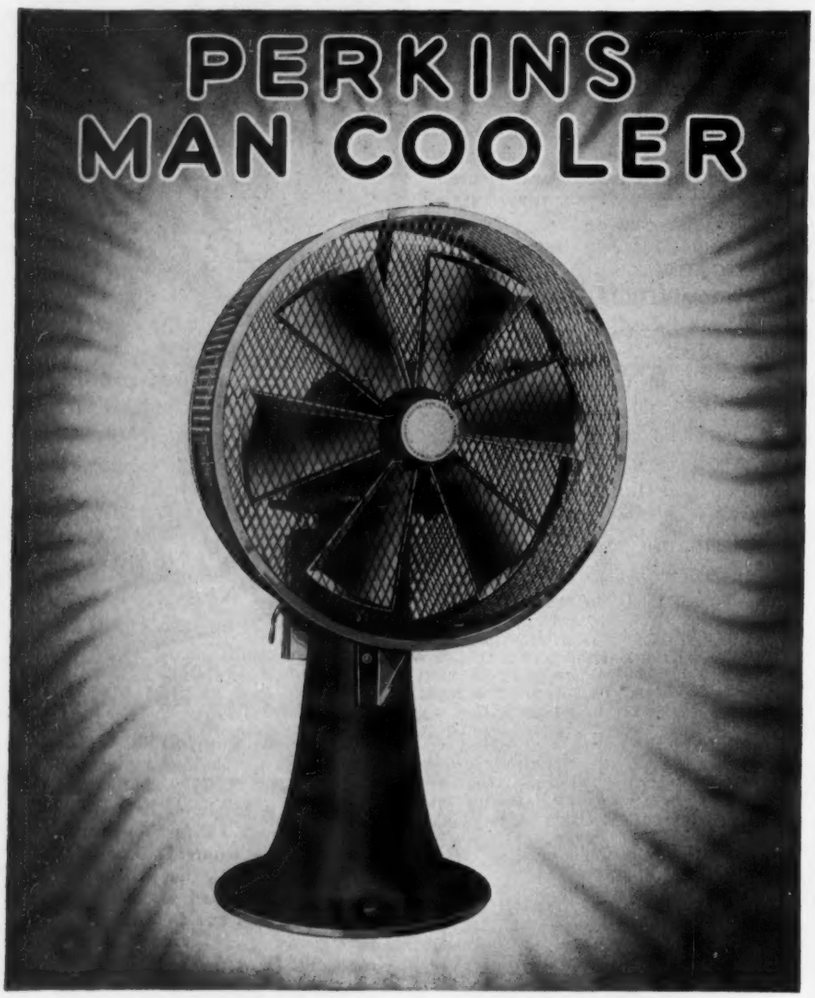
125 tons, addition to plant of California Portland Cement Co., Los Angeles, to Pacific Coast Steel Corp., San Francisco.

125 tons, plant addition, Rogers Brown-Lavino Co., Plymouth Meeting, Pa., to Norris Iron & Wire Works, Bridgeport, Pa.

120 tons, garage for Glendale, Calif., to Consolidated Steel Corp., Los Angeles.

115 tons, postoffice, Hagerstown, Md., to Maryland Steel Products Co., Baltimore; through Spence Bros., Saginaw, Mich.

100 tons, tank supports, awarded through M. W. Kellogg Co., Jersey City, N. J., for the Atlantic Refining Co., Philadelphia, to the Belmont Iron Works, Eddystone, Pa.



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ENGINEERS AND MANUFACTURERS

Shape Contracts Pending

10,410 tons, including 6000 tons of fabricated structural steel, 4000 tons of steel sheet piling and 410 tons of various rolled and forged metals, dam No. 26, Mississippi river, Alton, Ill.; Engineering Construction Corp., New York, low at $4,865,716.80, followed by United Construction Co., Winona, Minn., $5,062,027.15; Dravo Contracting Co., Pittsburgh, $5,494,431, and Bridge Builders Inc., San Francisco, $5,791,791.40.

8000 tons, mainly piling, repairs to piers, army base, Boston; T. Stuart & Son Co., Watertown, Mass., low, at $839,600.

7000 tons, postoffice, St. Louis; bids May 14.

5000 tons, estimated tonnage, single-span bridge across Harlem river, to be constructed for the department of parks, New York, acting as the Henry Hudson parkway authority; Robinson and Steinman, consulting engineers. Plans approved by the war department April 16.

2000 tons, Wheeler dam, Sheffield, Ala.

1296 tons, piling, Cherry creek retarding dam, near Sullivan, Colo., for Denver; bids April 24.

1200 tons, distillery, Louisville.

950 tons, state bridges, Minnesota.

750 tons, grade elimination, New York, New Haven & Hartford railroad, at Hartford; M. A. Gammino Construction Co., Providence, R. I., low.

750 tons, state bridges, Texas.

575 tons, building, Nashville, Tenn., for S. H. Kress Co.

500 tons, state bridge, Paulsboro, N. J.; Gray Construction Co., Morristown, N. J., general contractor.

500 tons, piling, extension of Wheeling & Lake Erie railroad dock at Huron, O., now being built; may be authorized shortly.

330 tons, bridge, Madison county, Illinois; Midland Structural Steel Co., Chicago, low.

300 tons, plant addition, Intag Co., Chicago; Austin Co., Cleveland, low.

300 tons, service parts building, Chevrolet Motor Co., Atlanta, Ga.

250 tons, plant building, International Harvester Co., Chicago.

260 tons, state hospital building, Rome, N. Y.

225 tons, building for Model Works, Girard, Pa.

225 tons, state bridges, South Dakota.

200 tons, beef house, Armour & Co., Chicago.

175 tons, service building, St. Louis, for Chevrolet Motor Co., Detroit.

140 tons, state undercrossing at Tenino, Wash.; Sather & Sons, Seattle, general contractors.

100 tons, including reinforcing, Seattle water system dam and crest gates; bids April 25.

Youngstown Sheet & Tube Co., Youngstown, O., has moved its office at Washington from 508 Munsey building to 916 Shoreham building, effective April 18.

Reinforcing

Reinforcing Bar Prices, Page 55

New York—The outlook is improved by pending heavy requirements for highways and bridges in New York and New Jersey.

A sharp increase is noted in the number of inquiries for small lots, 50 tons and less. Under the new freight surcharges, reinforcing bars, cut lengths, will be 2.50c, delivered to the job in New York territory, in carlots.

Pittsburgh — Impending freight rate surcharges drove a number of small orders to the contract stage last week. The increase cannot be applied to specific building projects under contract, therefore, on these freight rate increases will have to be absorbed by the bar seller. In connection with flood control projects, an allotment of approximately $50,000,000 for construction of 13 dams, nine of which would be in Pennsylvania, is being sought in the house of representatives in Washington. The market holds at 2.05c, Pittsburgh, for new billet steel in cut lengths, carload lots.

Cleveland—Several hundred tons of reinforcing bars are expected to develop from the federal $2,800,000 housing development on Whisky island, at the mouth of the Cleveland flats, where Secretary Ickes says 621 families will have a "magnificent" view of Lake Erie. Land has been acquired, and the project is being pushed. Except for government work in the Muskingum, Ohio, conservancy district, demand is quiet. The state is taking bids on a half dozen road projects, requiring a total of 100 tons of reinforcing bars.

Chicago—Reinforcing awards the past week were the heaviest in years, due to the placing of 11,000 tons for the Fort Peck, Mont., dam spillway, and 6200 tons for the sewage disposal plant at Stickney, Ill. About 2000 tons additional remains to be closed for Chicago sanitary district work, while pending business for miscellaneous public and private projects remains fairly large.

Boston—Reinforcing steel buying is largely in small lots with the aggregate tonnage small. Outlook for volume is enhanced, however, by additional highway and bridge projects about to come out for several New England states.

Philadelphia—Although 120 tons for a high school at Cumberland, Md., are reported placed, the reinforcing bar market here is dull. With intrastate rates still unchanged, the delivered price here on billet steel bars, cut lengths, holds at 2.34c, Pittsburgh.

San Francisco—A fair volume of reinforcing bars moved during the week, when over 2500 tons were placed. The outstanding award went to Truscon Steel Co., Youngstown, O., 670 tons for the Marina junior high school, San Francisco.

Seattle—Small tonnages predominate, and while some substantial jobs are planned, they are not up for figures. Bids will be opened at Boise, Idaho, April 19 for a 771-foot state

Concrete Awards Compared

	Tons
Week ended April 20	20,495
Week ended April 13	3,346
Week ended April 6	2,059
This week in 1934	5,820
Weekly average, 1934	4,084
Weekly average, 1935	5,711
Weekly average, March	5,506
Total to date, 1934	81,012
Total to date, 1935	91,379

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subway at Nampa, Idaho, tonnage unstated. Washington state college, Pullman, will receive figures April 24 for a 4-story concrete men's dormitory to cost $175,000, plans by Stanley Smith, college architect. Considerable reinforcing steel will be required.

Reinforcing Steel Awards

11,000 tons, Fort Peck dam spillway, Wiota, Mont., to R. C. Mahon Co., Detroit; Addison Miller Inc. and Fielding & Shepley Inc., St. Paul, general contractors.

6200 tons, sewage disposal plant for Chicago sanitary district, Stickney, Ill., to Inland Steel Co., Chicago; Herlihy Mid-Continent Co., Chicago, general contractor.

670 tons, Marina junior high school, San Francisco, to Truscon Steel Co., Youngstown, O.

250 tons, plant building, Continental Can Co., Elwood, Ind., to Truscon Steel Co., Youngstown, O.; Austin Co., Cleveland, general contractor.

235 tons, pier No. 25, New York, to Igoe Bros., Newark, N. J.; through J. Rich Steers Inc.

200 tons, hospital, Warm Springs, Mont., to unnamed interest.

200 tons, repairs to George Washington high school, Los Angeles, to unnamed interest.

200 tons, Ford Motor Car Co. building, exposition, San Diego, Calif., to unnamed interest.

200 tons, music bowl, exposition, San Diego, Calif., to unnamed interest.

200 tons, blending bins for Spokane Portland Cement Co., Spokane, Wash., to Pacific Coast Steel Corp., Seattle; reported last week as 180 tons to unstated fabricator.

175 tons, building, state hospital, Taunton, Mass., to Northern Steel Co., Boston; Thomas O. Connor & Co., Cambridge, Mass., general contractor.

163 tons, Figueroa street tunnel, Los Angeles, to unnamed interest.

150 tons, additional requirements, for pier to Triboro bridge, New York, to Natioal Bridge Co., Long Island City, N. Y.; through Frederick Snare Corp., New York.

150 tons, government building, exposition, San Diego, Calif., to unnamed interest.

125 tons, Coyote dam spillway, San Jose, Calif., to unnamed interest.

120 tons, high school, Cumberland, Md., reported placed through George Hazelwood, that city, with an eastern Pennsylvania seller.

117 tons, Patrick Henry school, San Francisco, to Concrete Engineering Co., San Francisco.

110 tons, two state bridges, Plumas county, California, to unnamed interest.

110 tons, building, city hospital, Worcester, Mass., to Concrete Steel Co., New York.

100 tons, warehouse addition, 863 Rialto street, San Francisco, Calif., to unnamed interest.

Reinforcing Steel Pending

525 tons, state bridges, Texas.

475 tons, including 200 tons of anchor bars, O'Shaughnessy dam enlargement, Hetch Hetchy project, San Francisco; general contract to Transbay Construction Co., San Francisco.

415 tons, Cherry creek retarding dam, near Sullivan, Colo., for Denver; bids April 24.

350 tons, Francis Scott Key school, San Francisco; bids April 24.

247 tons, state bridge, Los Angeles county, California; bids May 2.

150 tons, filter plant, Racine, Wis.

Unstated, 771-foot subway, Nampa, Idaho; bids in.

Unstated, men's dormitory, Washington state college, Pullman; bids April 24.

Unstated, dam and extension hydroelectric plant, Spokane, Wash.; funds allocated.

Unstated tonnage, sewage treatment plant, Waukegan, Ill.; bids May 3.

Unstated tonnage, water reservoir, Louisiana, Mo.; bids May 1.

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HOTEL CLEVELAND Cleveland

Semifinished

Semifinished Prices, Page 55

With tin plate producers still on capacity schedules, shipments of semifinished steel for their account continue to dominate the market. A fair demand continues for sheet bars, and wire rods have shown some slight improvement, but the billet and skelp markets are slower. Billets, blooms and slabs are $27, Pittsburgh; sheet bars, $28; and wire rods, $38.

Wire

Wire Prices, Page 55

Pittsburgh—Considerably heavier demand for field and farm fencing is apparent. Confusion exists regarding new delivered prices, especially on merchant wire products, where inconsistencies have arisen in interpretations of intrastate and interstate applications of the surcharge in respect to the wire industry's many basing points.

Cleveland—Demand for wire and fencing from agricultural districts is in the largest volume since the spring of 1930, this lifting production here slightly. Sales of manufacturers' wire also are well sustained, but jobbers in this district are not laying in more stocks than for which they anticipate an early demand.

Chicago—Activity in the steel wire market is well maintained despite recession in demand for certain products. Shipments of merchant products to agricultural districts are less active, but the movement from distributors' stocks is better than was anticipated. Automotive demand for manufacturers' wire is slower than earlier in the year, but prospects for fairly steady buying are favorable. Little change has occurred in manufacturers' wire needs of miscellaneous users.

Boston—Wire buying has improved slightly, notably spring and lighter wires entering into manufactured consumer goods. Cable and rope departments as a rule are operating below normal. Specialty demand is steady, but finds little support from the textile industry.

Pig Iron

Pig Iron Prices, Page 56

Pittsburgh — Foundries are taking in more iron, with the result shipments in this district show indication of being the best of any month so far this year. Because of localized merchant iron markets here the freight rate surcharge application will not affect any local hauls as much as the maximum increase of 40 cents a ton. Pittsburgh district furnaces continue to quote $18 per ton for basic grades; $18.50 for foundry, and $19 for bessemer. Pittsburgh Steel Foundry Co., Glassport, Pa., has been awarded sub-contract for approximately 250 tons of steel castings for locks 10 and 16 at Guttenberg, Iowa, and Muscatine, Iowa.

Cleveland—Shipments so far this month are slightly heavier than in the comparable period in March, and indicate a substantial demand in automobile, heating equipment, agricultural implement and machine tool manufacture. The movement was stimulated moderately by the interstate freight surcharges which went in effect April 18. As the Ohio and Michigan intrastate advances will not go in effect for 30 days some consumers may enlarge their stocks. The Ford Motor Co. has been in the market recently for 10,000 tons of foundry iron. General Motors is understood to have stocks sufficient up to July.

Chicago—Pig iron shipments continue 5 to 10 per cent heavier than during the corresponding March period and, with a slight increase in foundry operations, outlook for sustained deliveries during the balance of April is favorable. Automotive and farm implement foundries show little deviation from the relatively high operating rate they have experienced the past few months. Pig iron prices for delivery in the Chicago switching district are unchanged, the state commerce commission disallowing the 10 per cent increase authorized by the interstate commerce commission in switching rates. Scheduled advances will be

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applied on intrastate shipments in Illinois, however. Base prices continue $18.50, furnace, for No. 2 foundry and malleable. Lake Superior charcoal iron now is $24.2528, delivered Chicago. General Steel Castings Corp., Granite City, Ill., has closed on its recent inquiry for 10,000 tons of basic iron.

Boston—Pig iron buying continues sluggish. Shipments from the Everett, Mass., base on the New York, New Haven & Hartford railroad, will not be advanced under the new freight rates, being in competition with truck and water charges. On the Boston & Albany and Boston & Maine railroads the 7 per cent increase will apply.

New York—Pig iron shipments tapered slightly during the latter part of last week, following the advance in freight rates. In general the market is dull. The increase in emergency surcharges has resulted in an increase of about 10 cents in the delivered Newark, N. J., prices and 16 cents in Brooklyn, N. Y., prices.

Philadelphia — Due to delay by the Pennsylvania Public Service commission in approving emergency surcharges on iron and steel freight rates in intrastate traffic, delivered prices on pig iron continue unchanged. While in some quarters it is considered a possibility that the commission will not approve the increases, most traffic men here look for approval shortly. Meanwhile, shipments of pig iron are improved slightly, due in a small measure to the desire of consumers to get requirements on cars before higher rates become effective.

Buffalo — Shipments of pig iron from local furnaces during the first two weeks of April were at least equal to those of the entire month of March. This was due, however, to consumers taking out tonnage before higher freight rates went into effect. Shipments following the rate increase showed sharp curtailment. Buffalo furnaces have shipped 2000 tons of iron by barge canal so far this season and will continue to move additional tonnage throughout the week.

Cincinnati — Pig iron shipments are steady, close to March levels. Only a moderate spurt in shipments resulted from efforts to avoid freight increases, individual orders in this class being small. Definite announcement has not been received regarding the stand of southern furnaces shipping into this territory. Intrastate shipments are unaffected by the rate change, so far, and southern furnaces to maintain the present differential in delivery price ot 38 cents face absorption of a minimum freight increase of 25 cents. On the other hand, northern furnaces not using water shipments of ccal and ore are debating higher third quarter prices.

St. Louis—Shipments of pig iron to melters in this area so far in April are in excess of the total tonnage moved during the entire month of March. Heavy deliveries reflect a desire to get in iron prior to the advance in freight rates. March business of stove foundries fell off slightly compared with February.

Birmingham, Ala. — Spot orders still call for steady delivery of foundry iron. Casual survey shows little iron on yards of steady melters. Local consumers express no apprehension as to higher prices.

Seattle—Prices are unchanged for the second quarter, No. 1 Columbia, 1.75 to 2.25 per cent silicon, being quoted $17.50, base, Ironton, Utah, and $22, base, Seattle. Demand has improved over a month ago, seasonal requirements and better conditions generally being noted among foundries. Imported iron is making no inroads in this territory. British coke remains unchanged at $12.50, volume of sales continuing steady.

Toronto, Ont. — Pig iron sales, while confined to small tonnage lots, are in better volume. The daily melt is holding around 40 per cent with indication of further improvement. Pig iron production also is holding close to the peak level for the year.

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Scrap

Scrap Prices, Page 57

Pittsburgh—Doubtless forecasting a resumption of mill buying interest, going prices in the local scrap market last week took on a steadier tone with firmness to present quotations. With machine shop turnings advancing 25 cents a ton on a district mill's inability to purchase around 10,000 tons at less than $8 and railroad steel specialties strong at $14 to $14.50, the entire market presents a stronger front. The sole exception appears to be weakness in hydraulic compressed sheets, where mills report ability to buy freely at $11.

Cleveland—Some moderate purchases of open-hearth and blast-furnace grades have been made recently. Strictly No. 1 heavy melting steel is scarce and dealers are slow to sell short. A valley interest has bought considerable tonnage to supply its immediate needs and lower prices were developed.

Chicago—Scrap prices are steady, with some additional small tonnages of heavy melting steel placed lately

at $10. Dealers still find it difficult to cover orders at less than $9.75, since scrap is coming out in only moderate lots. Purchases of heavy melting steel over the past two weeks are estimated to have totaled 15,000 to 20,000 tons. Unshipped orders, however, are smaller than 30 days ago. Freight rates in the Chicago switching are not affected by the emergency surcharge so long as the movement is confined wholly within Illinois.

Boston—Being competitive with trucks, scrap delivered at several important New England consuming points, notably Worcester, Mass., will not take the 7 per cent advance in freight rates. Prices are unsettled. The Worcester consumer will not pay better than $7.75, delivered, for No. 1 heavy melting steel and recently bought a round tonnage at that price. For boat-loading this grade was advanced 25 cents a ton, dock, last week. Iron car wheels are easier.

New York—Heavy melting steel is down 50 cents per ton for export, dealers paying $8.50, barge, for No. 1 and $7 for No. 2. Turnings and breakable cast are also easier. Domestic demand is light while export buying lacks the snap of several weeks ago.

Philadelphia—For the first time in almost three months, the leading Coatesville, Pa., consumer of steel scrap is issuing some releases. While these releases apply to orders, the action stimulates trade sentiment. One leading exporter here may also resume taking shipments for Port Richmond in the near future, and the leading Claymont, Del., consumer continues to purchase small lots of No. 1 steel at $10, delivered. The market is steadier, with prices unchanged. In the adjacent Baltimore district, Sparrows Point continues to take substantial tonnages of No. 1 steel at $10, delivered.

Buffalo—Dealers report shipments on contracts for heavy melting steel are being restricted by principal consumers here. Stocks in consumers' yards are being augmented by small deliveries by water. Machine shop turnings have become a drug and there is talk of shipping this material to distant points for consumption. Prices are nominal.

The Lackawanna consumer has recently purchased a fair tonnage of No. 1 steel at $9.50, delivered.

Detroit—Iron and steel scrap prices are unchanged this week. Dealers believe the market has definitely hit bottom, although in view of heavy production no immediate increase seems probable. Lake shipments are moving slower than usual and dock accumulations are large.

Cincinnati—Heavy melting steel is off 25 cents, now quotable $7.75 to $8.25. Prices on prime cast scrap are holding although the entire market is soft in absence of tonnage buying. Mills are exerting pressure on prices, and dealers are wary of selling short at current prices.

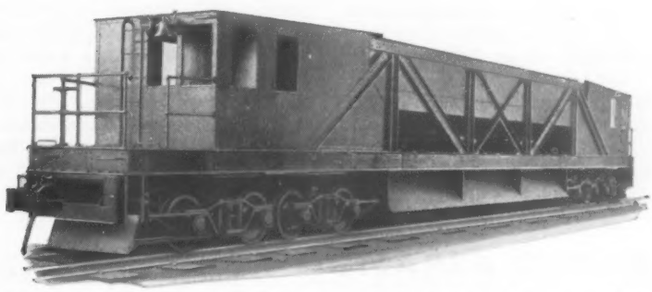
St. Louis—Iron and steel scrap at a standstill. Purchasing by the industries is negligible and trading among dealers and brokers is the smallest in a number of months.

Birmingham, Ala.—Continued lagging is noted in the iron and steel scrap market and purchases are in limited quantities for immediate delivery. Quotations are weak, even in the face of recent readjustments.

Seattle—Prices still are out of line and no new business has been closed for the orient for several weeks. With the eastern market 50 to 75 cents lower than on the Pacific, Atlantic shippers are able to quote at least 25 cents, c.i.f., below exports in this area, taking the higher freights into consideration. Shippers are unwilling to meet eastern competition and are asking $9.75 for No. 1 melting and $11 for rails.

Toronto, Ont.—Improvement in the iron and steel industry is reflected in better demand for scrap. Sales are largely of steel grades and local

ATLAS ORE TRANSFERS



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dealers report good shipments of heavy melting steel to Hamilton mills. Montreal dealers also report improved demand for heavy melting steel, wrought iron and steel axles, and dealers in this area are said to be preparing to resume export shipments to Britain.

Warehouse

Warehouse Prices, Page 58

Pittsburgh—Jobbers report orders more frequent, and April volume to date is ahead of the same March period. Prices are steady.

Cleveland — Warehouse orders were a little lighter during the week, affected by adverse weather conditions. Volume so far this month is on a parity with that for the same number of days in March. The rule regarding the emergency freight surcharge on interstate shipments is that carloads take the 7 per cent; less-carloads shipped up to 220 miles are exempt, but less-carloads shipped more than 220 miles are subject to surcharges which range up to a maximum of 10 per cent. The Ohio public utilities commission, however, has not yet authorized any surcharges on intrastate shipments, and has indicated it will not do so until railroads file such charges, and a hearing is held, with the effective date not less than 30 days from filing.

Chicago—April sales show only a small decrease from the comparable March period and no more than usually experienced at this time. Sales remain fairly well diversified. Prices are unchanged.

Boston—Warehouse volume has improved steadily with buying well spread. Orders, as a rule, are not large, but are more numerous. Imported bars are an increasing factor.

New York — Recently improved volume with warehouses is maintained by an increased number of small miscellaneous orders. Prices are unchanged and on most products steady, bolt and nut quotations still being unsettled.

Philadelphia—Jobbing demand is holding up well, with most resellers now predicting a better month in April than in March. Prices have remained unchanged since the reduction in cold-finished bars.

Baltimore—Warehouse prices have continued steady since the reduction of $3 a ton in cold-finished bars. Volume is being barely sustained, despite improved weather conditions which should make for greater building requirements.

Detroit—Some die and tool shops are beginning to figure on work which ordinarily would not be coming out before the summer months, indicating that warehouses may escape part of the usual summer lull. The present volume holds steady.

Cincinnati—Demand for steel from jobbers is steady. Reinforcing bars remain at 3.25c, other items advancing 2 cents per 100 pounds because of new freight rates.

St. Louis—Sales of iron and steel from warehouses have receded slightly during the past two weeks, the volume for that period being slightly below a month earlier.

San Francisco—Distributors report a fair volume of business and believe first half sales will show a considerable improvement over those for the same period last year. Prices are firm in all lines.

Seattle — Volume has declined slightly this week but jobbing houses report a fair turnover. Prices are firm.

CARNEGIE ABRASION RESISTING STEEL AGAIN PROVES ITS SUPERIOR QUALITIES

On a recent dredging operation on the Columbia River, two kinds of dredge pipe were used. The engineer reports that:

After handling 3,000,000 cu. yds. of sand and gravel, the mild steel dredge pipe was worn through. The pipe made from Carnegie Abrasion Resisting Steel had merely been well polished.

This is a typical report from a user of Carnegie Abrasion Resisting Steel. In a wide variety of applications, results are consistently successful. *Your inquiries are solicited.* 323

CARNEGIE STEEL COMPANY • PITTSBURGH

United States Steel Corporation Subsidiary

Iron Ore

Iron Ore Prices, Page 57

Cleveland—Early action on Lake Superior iron ore prices is expected to follow on the Ford Motor Co.'s inquiry for 180,000 tons of basic and high-phosphorus ore. This is the first in the market, and producers are studying the question of absorbing the 11.2 cents per gross ton northern freight surcharge, or increase their prices an equivalent amount. Some of the leading steel companies are estimating their requirements, in order to specify to their associated mining interests. Ford's purchases, including the amount it will buy from the Blueberry mine, which it leases to the operators, may exceed 275,000 tons, the amount which it acquired last year from all sources.

The Lake Superior Iron Ore association reports the following:

	Tons
Ore consumed in February..	2,467,269
Consumed in March	2,582,986
Increase in March	115,717
Consumed in March 1934 ..	2,189,566
On hand at furnaces April 1, 1935	22,362,331
On Lake Erie docks April 1, 1935	4,569,298
Total at furnaces and Lake Erie docks April 1, 1935 ..	26,931,629
Total April 1, 1934	28,995,506

Ferroalloys

Ferroalloy Prices, Page 56

New York — Ferromanganese is $85, duty paid, Atlantic and Gulf ports, but delivered to Pittsburgh the

price has been increased 20c to $89.99, with Philadelphia instead of Baltimore now the nearest basing point. This shift results from the fact that the interstate rate from Baltimore to Pittsburgh has been increased to $5.13, as against the existing intrastate rate of $4.99 from Philadelphia to Pittsburgh, which for the present is unchanged.

Domestic spiegeleisen, 19 to 21 per cent, is unchanged at $26, Palmerton, Pa., on quantities up to 50 tons and $24 on 50 tons and over. The movement of both ferromanganese and spiegeleisen was recently stimulated by impending increases in freight rates.

Metallurgical Coke

Coke Prices, Page 55

Western Pennsylvania beehive coke producers continue to experience keen competition from New York, New Jersey and eastern Pennsylvania by-product coke producers, resulting in prices which they are unable to meet. Owing to heavy stock accumulations little coke tonnage is being taken in by blast furnace and foundry operators. Whereas the market on foundry coke is fairly firm at $4.60, Connellsville, Pa., ovens, for beehive grades, furnace coke at $3.60 a ton is irregular owing to some quotations being reported at as low as $3.40 in certain cases.

Eastern Pennsylvania coke consumers are quoted unchanged prices on their fuel but application of an advanced intrastate freight rate will cause an advance, if it is allowed by state authorities. At Chicago the switching charge is not applicable in Illinois but in Indiana a 10 per cent addition is applied. This will be absorbed by producers. Shipments there are at the best rate of the year to date. Birmingham, Ala., producers continue operations at an unchanged rate and prices are steady.

Coke By-Products

Coke By-Product Prices, Page 55

New York—Demand for distillates continues active, especially for toluol and xylol. Shipments of other coke by-products hold to the current rate with additional gains in demand for naphthalene. Prices are unchanged.

Nonferrous Metals

Nonferrous Metal Prices, Page 56

New York—With predictions of immediate price increases in lead freely made, heavy demand for this metal featured activity in the nonferrous metal markets last week. Zinc sales declined but copper maintained an average of about 1000 tons daily.

Copper — Brass mill operations held up well resulting in continued fair demand for copper. Interests in the trade confidently expect sales to exceed again the normal monthly book during April. March statistics revealed a cut of about 7700 tons in domestic stocks, including blister copper. Interest in the trade centers in the questions concerning the extension of the 4-cent copper import duty and the future of the code.

Lead—Demand was active with paint and sheet manufacturers and plumbing supply manufacturers well represented in the buying. Tone of the market was firm. It was understood that St. Joseph Lead moved substantial tonnages at $1 per ton premium on the New York market, or at 3.75c per pound.

Zinc—Only light carlot purchases were reported since the previous week when the largest volume of slab business since January, 1930 was booked. Galvanizers were the principal buyers. Shaded bids were refused during the latter part of the week and even bids of 4.10c for July delivery were refused by most sellers.

Tin—Straits tin sales were light but actual shipments of metal into consumption held up to a good pace. Prices eased off in the face of recessions in Singapore and the London markets. Spot was quoted around 50.62½c at the end of the week.

Antimony—Market was dull and unchanged at 14.25c, duty paid, for Chinese spot.

Steel in Europe

Foreign Steel Prices, Page 58

London—(*By Radio*)—Production and foreign trade in steel and iron products in Great Britain in March were greater in rate of output. With 97 blast furnace stacks active both months, pig iron gained 70,100 gross tons, from 483,100 tons in February to 553,200 tons in March. The daily rate in February was 17,253 tons and in March 17,845 tons.

Steel ingots and castings in March totaled 841,900 tons, compared with 769,500 tons in February, a gain of 72,400 tons. The daily rate in March was 32,380 tons, and in February 32,062 tons.

Iron and steel imports increased 22,675 tons, from 103,300 tons in February to 125,975 tons in March; exports rose from 172,900 tons in February to 175,765 tons in March.

The Middlesbrough pig iron mar-

THIS STAMPING halved THE COST

Even steel castings made by best foundry practise developed up to this time constantly failed under the high pressures and abuse this pressure fitting had to withstand.

Parish designing service produced the answer—a leak proof composite fitting of stamped-and-welded design that tested at 100 pounds air pressure and saved half the weight and half the cost. Naturally, it is now the standard.

Why not send us YOUR blue prints AND SPECIFICATIONS?

PARISH PRESSED STEEL Co.

(Specialists in difficult stamping design)
Robeson & Weiser Sts.,
READING, PENNSYLVANIA

Pacific Coast Rep.: **F. Somers Peterson Co., 57 California St., San Francisco, Cal.**

ket is dull but trade is better in the Midlands, some iron having been sold into third quarter. The steel industry is well occupied and tonnages are being shipped to South America and Australia. Various railroad equipment contracts have been placed by foreign buyers with Birmingham, Stafford and Glasgow firms. Exports of tin plate and galvanized sheets continue quiet.

The Continent reports some improvement in trade as Belgium and Luxemburg are adjusting domestic prices to the new value of the monetary unit.

Tin Plate

Tin Plate Prices, Page 54

Pittsburgh—Producers' backlogs extend for at least two weeks, with mill operations at 85 per cent. Heavy tin plate consumption by canmakers still is indicated by their frequent repeat orders.

Quicksilver

New York—Quicksilver prices are unchanged, round lots of 100 virgin flasks of 76 pounds being quoted $72.50 a flask, lots of 15 to 24 flasks, inclusive, $74, and single flasks $75. The market is quiet.

Milwaukee Stamping Co., Milwaukee, finds its business volume this year about 20 per cent greater than a year ago, with prospects that July 1 will show a 25 per cent improvement. The payroll of 250 persons is 50 larger than a year ago. New lines of production have been added.

Meetings

CANADIAN foundrymen in preparation for the thirty-ninth annual convention of the American Foundrymen's association at the Royal York hotel, Toronto, Ont., Aug. 20-23, have set up the following committees:

Publicity committee: C. E. Macdonald, International Nickel Co. Ltd., Toronto, chairman; H. V. Butterfield, *Canadian Machinery & Manufacturing News*, Toronto; and Francis H. Bell, *Canada's Foundry Journal*, Toronto, vice chairman.

Transportation committee: Col. J. Inglis, Toronto Hardware Mfg. Co. Ltd., Toronto, chairman; Lieut. Col. Mess, Whiting Corp., Toronto; and William Coulter, Coulter Brass & Copper Ltd., Toronto, vice chairmen.

Hotel and Entertainment committee: D. B. McCoy, Steel Co. of Canada Ltd., Hamilton, Ont., chairman; R. C. Yates, Canadian Furnace Co. Ltd., Port Colborne, Ont., and Rex Nicholson, Algoma Steel Corp. Ltd., Toronto, vice chairmen.

Golf committee: E. Holt Gurney, Gurney Foundry Co. Ltd., Toronto, chairman; E. C. Burton, Link-Belt Co. Ltd., Toronto, and Clifford Sherman, Grinnell Co. Ltd., Toronto, vice chairmen.

Plant Visitation committee: Melville T. White, Canadian General Electric Co. Ltd., Toronto, chairman; O. H. Shenstone, Massey-Harris Co. Ltd., Toronto, and C. L. Ley, Dominion Wheel & Foundries Ltd., Toronto, vice chairmen.

DWYER ON FOUNDRY PROGRAM

Pat Dwyer, engineering editor of THE FOUNDRY, Cleveland, will talk on "Gates and Risers for Castings" before the northeastern Ohio chapter of the American Foundrymen's association at the Cleveland club, 10660 Carnegie avenue, Cleveland, April 25, at 6:15 p.m. Elmer Zirzow, chief chemist, Cleveland works of National Malleable & Steel Castings Co., will give a coffee talk on sand testing.

DELAY MEETING 9 DAYS

National Electrical Manufacturers association will hold its spring meeting at the Homestead hotel, Hot Springs, Va., May 19-23, instead of May 11-14, as previously noted. R. J. Blais, 155 East Forty-fourth street, New York, is secretary.

GEAR MAKERS MEET IN MAY

American Gear Manufacturers' association will hold its annual meeting at the Penn-Lincoln hotel, Wilkinsburg, Pa. (Pittsburgh), its headquarters, May 14-15.

¶Association of Iron and Steel Electrical Engineers, Empire builders, Pittsburgh, has announced it will hold its annual convention and iron and steel exposition at Pittsburgh, Sept. 24, 25 and 26, 1935.

¶National Metal Trades association, Chicago, has postponed to May 15-16 the convention and exhibit scheduled for April 24-25 in Cleveland.

Financial

FIRST of the larger steel companies to report for the first quarter, Gulf States Steel Co., Birmingham, Ala., shows a profit of $30,149 for that period after all charges. A year ago it lost $9813. Bethlehem Steel Co. will issue its report Thursday; the United States Steel Corp. a week from Tuesday.

BYERS MUM ON SALARIES

When requested last week by the securities and exchange commission to report executive salaries, A. M. Byers Co., Pittsburgh, joined the group of firms which refuses to divulge salary information.

WILL PAY ON COMMON

Harbison-Walker Refractories Co., Pittsburgh, has declared a 25-cent common dividend payable June 1 to May 15 record, in addition to the regular $1.50 preferred dividend payable July 20 to July 8 record.

G. E. SALES UP 16 PER CENT

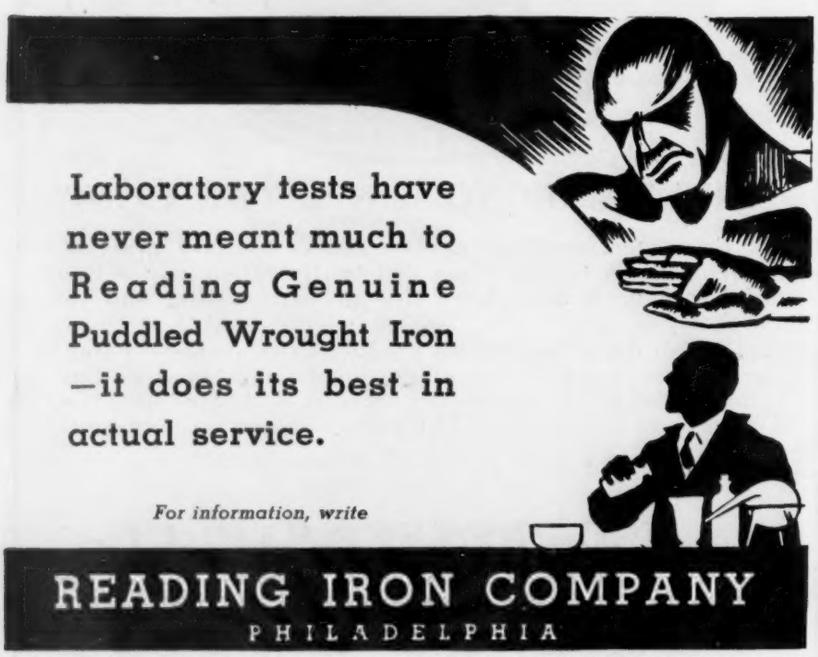
Sales billed by General Electric Co., Schenectady, N. Y., for the first quarter of 1935 amounted to $40--393,538, compared with $34,935,-551 for the same quarter a year ago, an increase of 16 per cent.

WICKWIRE PLAN IS DELAYED

Wickwire Spencer Steel Co.'s action for re-organization plan submitted by the stockholders' protective committee has been delayed, pending submission of another plan on May 7 by the re-organization committee of the company.

CHECK UP ON HECKLERS

A wave of heckling of executives


Laboratory tests have never meant much to Reading Genuine Puddled Wrought Iron —it does its best in actual service.
For information, write
READING IRON COMPANY
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SCIENCE AND INVENTION HAVE NEVER FOUND A SATISFACTORY SUBSTITUTE FOR GENUINE PUDDLED WROUGHT IRON

at annual stockholders' meetings of corporations, from which steel producers have not been exempt, is expected to result in a check of stockholders to determine whether persons have been buying a share or two in an effort to gain admittance to these meetings and create trouble.

LOOKS FOR JAIL BUSINESS

Van Dorn Iron Works Co., Cleveland, reports net profit of $11,160 for the March quarter, against loss of $81,483 in all 1934. The company has unfilled orders totaling $259,765; it expects to get some jail business from the work relief program.

Otis Steel Co., Cleveland, reports net profit of $560,000 for 1934.

Activities of Steel Users and Makers

(*Concluded from Page* 19)

construction. The total cost is $2,303,344. The Cleveland Tractor Co. has increased its working force from 500 to 750 workers and the order will keep the plant in operation at capacity well into the summer.

♦ ♦ ♦

Theodore Geissmann & Co. Inc., Chicago, mill representative for various steel products, is moving its offices from 180 to 360 North Michigan avenue.

♦ ♦ ♦

Doelger & Kirsten Inc., Milwaukee, manufacturer of alligator shears, notes increased activity in demand for its products. The company is perfecting a new size shear, designed to cut 5-inch mild steel. It weighs 30,000 pounds.

♦ ♦ ♦

Detroit Electric Furnace Co., 825 West Elizabeth street, Detroit, has received an order from Fiat Motor Co., Torino, Italy, for a 1000-pound rocking electric furnace for use in its brass foundry. This is the second furnace of this type bought by Fiat.

♦ ♦ ♦

A. O. Smith Corp., Milwaukee, will go into production May 1 on oil well casing of a new type recently perfected. A welded steel pipe mill is being re-equipped for its manufacture. The product is cold-worked, has unusually high yield point and uses lighter section. It is designed for use at great depth.

♦ ♦ ♦

Lakeside Steel Improvement Co., Cleveland, has installed a Chapmanizing unit for hardening low-carbon steel, under exclusive license from the Chapman Valve Co., Indian Orchard, Mass., for northern Ohio. The process electrolytically ionizes and activates ammonia gas, which is passed into a fused salt bath where the active nitrogen is impregnated into the surface layer of the steel under treatment.

♦ ♦ ♦

Hendrickson Machine Co., 1310 East Fourteenth street, Cleveland, has been appointed distributor in northern Ohio of refrigerating equipment manufactured by the Frick Co., Waynesboro, Pa. Supplies of valves, fittings and spare parts will be carried. Units up to and including the 7 x 7-inch compressor will be available. Engineering service will be furnished.

♦ ♦ ♦

Timken Roller Bearing Co., Canton, O., has booked an order from the New York Central for bearings, main and side rods and other reciprocating parts to completely equip all driving axle crank pins of its high-speed streamlined steam passenger locomotive, the Commodore Vanderbilt. The locomotive is now equipped with Timken bearings on all axles and when the rods are so equipped it will be anti-friction-ized at all points.

♦ ♦ ♦

Wheeling Structural Steel Co., Wheeling, W. Va., with plant at Martins Ferry, O., has changed its name to Riverside Steel Co. Stanley MacComber, formerly head of the MacComber Steel Co., Canton, O., has been made vice president and general manager. The company has added to its products the Macomber line of bar joists, standard roof trusses, roof decking and other steel building materials.

♦ ♦ ♦

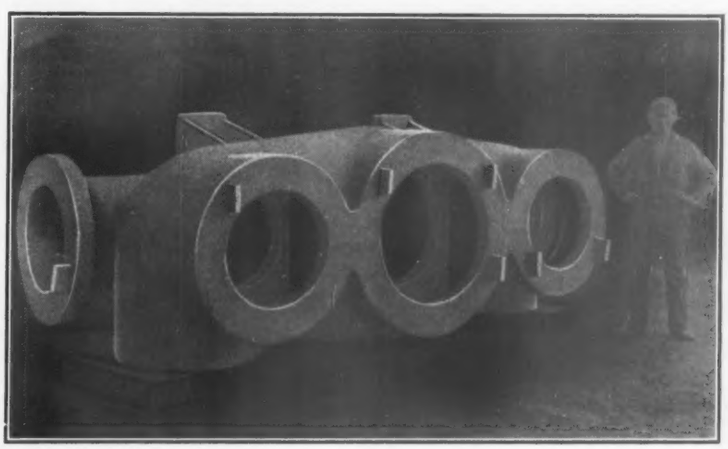
Keeler Brass Co., Grand Rapids, Mich., manufacturer of brass castings, hardware products and other metal specialties, has acquired the former factory of Standardized Furniture Co., totaling about 44,000 square feet of floor space, and will occupy part of the structure for expansion in the storage and distributing division.

♦ ♦ ♦

Uddeholm Co. of America Inc., 155 East Forty-fourth street, New York, seller of Swedish steel, has opened its own warehouse in Chicago for the distribution of Uddeholm hot-rolled tool steels and solid and hollow drill steel. The new warehouse is located at 1750-1752 West Carroll avenue, with P. L. Getzinger, in charge as district manager of sales.

Mr. Getzinger was affiliated for a number of years with the Columbia Tool Steel Co., Chicago Heights, Ill., was later Chicago manager of the Vulcan Crucible Steel Co., Aliquippa, Pa., and subsequently spent much time in the Middle West for the Edgar Allen Steel Co., New York.

QUALITY CASTINGS



22,000 lb. Steam Chest Body for Turbine

Rolled Steel Wheels — Rolled Steel Rings and Flanges
Forgings — Steel Castings — Steel Tires
Springs — Gear Blanks

STANDARD STEEL WORKS COMPANY
BURNHAM, MIFFLIN CO., PENNA.

Branch Offices
New York Philadelphia Chicago San Francisco
Akron Portland, O. St. Louis

Johnson Mild on Basing Points

(*Concluded from Page* 13)

I must confess that this phase has left me cold.

"The other is that open prices prevent unfair discrimination between buyers. Rebates, advertising allowances, diversion of brokerage, are all common methods of discriminating in favor of special customers."

Another reference which General Johnson made to the steel industry during the course of his testimony was when he was discussing the Darrow board and some of the cases that came before that board.

"Swenstrom of Duluth made a complaint of injury by the basing point system," he said. "An amendment to that code relieved him in May, 1934. His statement that the amendment making Duluth a basing point did not help him is untrue. Before the amendment the price to him was $43.60; afterward it was $39.50."

In finally summing up his statement the general said that he would not go into detail too great in writing the new NRA statute. "The trouble with the present one is too much language," he said. What is needed in the new law is this, General Johnson declared:

(1) Definitions of
  a. Labor policy.
  b. Monopoly or monopolistic practices.
  c. Unfair trade practice.
  d. Interstate commerce.
  e. Authority as between NRA, the labor boards, the department of labor and federal trade commission.
  f. Industrial self-government and federal supervision.
(2) The extent to which Congress intends to limit
  a. Price control.
  b. Production control.
  c. Applications to small enterprise.
(3) Very simple provisions for code organization and administration.

With General Johnson's testimony, the senate investigation is over. Before the senate is the bill of Senator Harrison, of Mississippi, extending NRA. Incidentally, it is now reported that if the Harrison bill becomes a law as it now stands, all codes will be automatically extended for a 90-day period following June 30 regardless of whether or not industries want to retain their codes.

A good deal of work on the proposed extension has been going on behind the scenes, and a report on the bill is expected possibly this week, surely next week. A story in Washington is that the measure may be radically changed in committee.

Move Poultry Case Ahead

One of the interesting sidelights on this legislation is the fact that the United States Supreme Court is co-operating with the administration in trying to get a quick decision on the constitutionality of the NRA act by advancing for argument on May 2 the case of the government against the Schechter Poultry Corp. of New York—considered a strong NRA case by officials of that body, and particularly by Donald Richberg.

If this case is heard on May 2, as now planned, the court in expediting it, will doubtless render a decision in May and give congress a chance to remedy any clauses that it might wish in accordance with the decision before the present statute expires on June 16.

Of course, this will mean a last minute rush, and congress may not want to wait that long, but doubtless it will be asked to do so by the administration, so when the law is again enacted it will not have to face the test of unconstitutionality which has been so continually waged against the Blue Eagle during the past couple of years.

The Supreme Court plans to adjourn for the summer on June 3, which means that its decision in this case will probably be handed down before that time. In recent years the court has planned to render decisions on all of the cases on the docket in which it has heard the arguments.

Ten Evansville, Ind., manufacturers who are users of pig iron recently appealed to Rep. John W. Boehne to use his influence to have the price provisions of NRA eliminated in any future legislation.

Before the senate finance committee he cited that the code for the iron and steel industry permits an increase of $2.58 a ton in pig iron north of the Ohio river, and denounced this practice as "illegal and discriminatory."

Bindley Heads Pittsburgh Purchasing Agents

Purchasing Agents' Association of Pittsburgh, holding a meeting in the William Penn hotel, Pittsburgh, April 16, elected Albion Bindley, general purchasing agent, Pittsburgh Steel Co., Pittsburgh, president for the coming year.

Thomas D. Jolly, director of purchases, Aluminum Co. of America, Pittsburgh, was named vice president, and A. D. Feeman, purchasing agent, Superior Steel Corp., Carnegie, Pa., was named secretary.

E. C. Buerkle, purchasing agent, National Bearing Metals Co., Pittsburgh, was elected treasurer, and I. E. Walton, purchasing agent, Heppenstall Co., Pittsburgh, national director to the National Association of Purchasing Agents, New York.

Mr. Bindley succeeds I. E. Walton as president, and Mr. Jolly succeeds Mr. Bindley as vice president.

The following new directors were elected for a two-year term out of ten nominees: C. G. Bunnell, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; R. W. Mackensen, Pittsburgh Coal Co., Pittsburgh; F. H. MacKnight, Westinghouse Air Brake Co., Wilmerding, Pa.; G. Walter Sanborn, United Engineering & Foundry Co., Pittsburgh, and H. V.

Strong
STEEL CASTINGS

Acid Open-Hearth Steel

from 1 lb. to 30,000 lbs.

STRONG STEEL FOUNDRY CO.
BUFFALO, N. Y.

Natcher, M. B. Suydam Co., Pittsburgh.

The following five directors elected for a two-year a year ago carry over for one year more: J. B. Connally, Mesta Machine Co.; T. D. Jolly, Aluminum Co. of America; R. D. King, Koppers Co.; R. L. Walliser, Allis-Chalmers Mfg. Co., and J. M. Knowles, Consolidation Coal Co.

Equipment

Pittsburgh — Details of award by American Sheet & Tin Plate Co. on its 72-inch continuous hot and cold-rolled strip mill are expected shortly. A leading steel mill equipment builder is reported favored for a major portion of the contract covering the hot mill. Republic Steel Corp. continues to inquire for new three-high and four-high mill equipment for its Warren, O., works. Northwestern Barbed Wire Co., Sterling, Ill., is contemplating the purchase of a used electric furnace for melting scrap. An important announcement covering a large by-product coke oven installation is pending.

Chicago — Equipment markets are quieter, both orders and inquiries for metalworking machinery being less active than a week ago. Machine tool business is limited to occasional individual lots. Railroad purchases of machine tools are light, but pending business is enlivened by inquiries for several tools from the Santa Fe and Missouri Pacific roads. The latter is inquiring for six tools, principally lathes and drills. Small tool business is maintained relatively better than demand for larger equipment, but is less active than deliveries a month or two ago.

Buffalo — Electrical equipment for the new continuous hot strip mill at the Lackawanna plant of Bethlehem Steel Co., involving expenditure of $1,250,000, will be installed by General Electric Co. Seven direct-current motors totaling 22,500 horsepower, three motor-generator sets, ventilating system for motor room, switchgear and control equipment are included in the order.

Washington — Ordnance division of the war department has awarded contracts for machine tools and equipment totaling $376,646.18 on recent bids involving expenditure of $600,000. Thirty-two manufacturers shared in the business, which brings total equipment awards from this government department in the past year to over $2,000,000.

Seattle — Mining equipment continues in strong demand and heavy shipments are being forwarded to Alaska.

New York—Government inquiry still predominates in the demand for machinery. Sheet metal working tools lead demand for private industry. Shaw-Box Crane & Hoist Co., Muskegon, Mich., is low on a 10-ton electric bridge crane for the navy aircraft factory, Philadelphia.

Boston — Machinery and plant equipment volume is rather unevenly spread among New England plants, some operating at full schedules with fair backlogs while others are doing little. The slump in the New England textile industry is having an adverse influence. Inquiry for the navy, arsenals and other government requirements is well sustained.

Construction and Enterprise

New York

BROOKLYN, N. Y.—Signal supply officer, army base, will open bids May 13, circular 113, for 350 generators, type GN-35.

BUFFALO — Consolidated Aircraft Corp., specialist in building of flying boats and army fighters, will move its plant to San Diego, Calif.

NEW YORK—Cellutate Inc., Manhattan, has been organized to deal in machinery and tools. Papers filed by William Weisman, 270 Broadway.

NEW YORK—Petroleum Conversion Co., 90 West street, plans to rehabilitate the refinery at Texas City, Tex., which has been idle for ten years. Cost is estimated at $30,000.

NEW YORK—Lucas L. Lorenz Inc. has been incorporated by Lucas L. Lorenz, Daniel F. Lorenz and Herbert N. Lorenz, to manufacture provision machinery, hardware goods and apparatus. Papers filed by Clarence Seid, 25 Willoughby street, Brooklyn, N. Y.

ROCHESTER, N. Y.—George Kircher & Son have submitted low bid of $58,975 for construction of a cannery at the Albion school for women.

Ohio

CINCINNATI—Lieut. Col. Charles L. Hall, United States district engineer, has compiled a list of 22 power projects estimated to have potential power of 302,900 kilowatts. These projects will involve an expenditure of $73,123,000.

CLEVELAND—Grahling Bros. Co., now at 4603 Fenwick avenue Southwest, has taken a five-year lease on the former B-Line Boiler plant at East 131st street and Taft avenue. This factory contains more than 23,000 square feet of floor space and is arranged in modern manner for production. The lessee, maker of residential lighting fixtures, will move in May.

COLUMBUS, O.—Sunday Creek Machine Shop Inc. has been incorporated with $5000 capital, by S. G. Hughes, M. I. Penn, C. C. Cook, Sunday Creek Coal Co., 44 East Broad street.

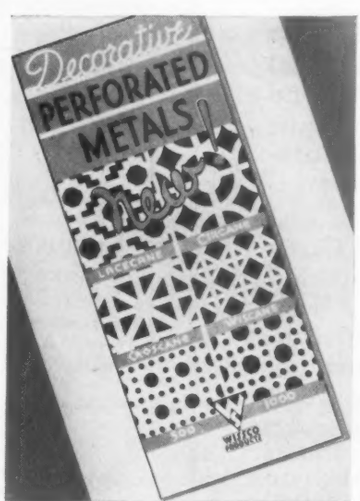
ELYRIA, O.—Western Automatic Co. is contemplating an expansion program at its plant here, although for the present, officials decline to reveal the extent of this program.

FREMONT, O.—Pet Milk Co., 1401 Arcade building, St. Louis, is contempating construction of a processing plant near here.

NORWALK, O.—The blacksmith and forge building of the Norwalk Drill Tool Co. recently were severely damaged by fire.

WELLSVILLE, O.—Sterling China Co. has begun work on its $175,000 expansion program to include two tunnel kilns, new offices and sample room and

(*Please turn to Page 77*)



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on Decorative Perforated Metals

New uses of Decorative Perforated Metals demand more attractive period designs and increased free air space. Send for this folder and see the new Wissco Designs.

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41 East 42nd St., New York City

Please send me your New Folder featuring Decorative Perforated Metals.

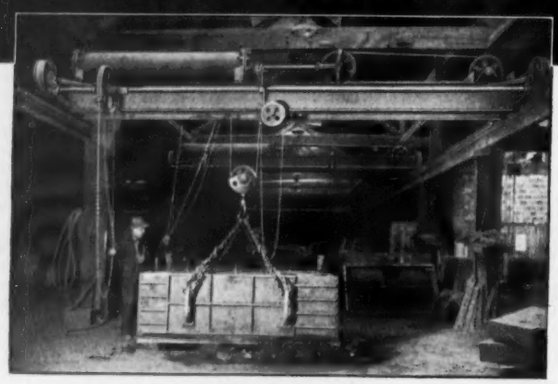
Name.....

Street.....

City..... State.....

Our CURTIS CRANES AND HOISTS Are Indispensable

*writes
A. K. Hanchett, President, Hanchett Mfg. Co., Big Rapids, Michigan



The Hanchett Manufacturing Company makes heavy special production machinery for automotive plants. For over 25 years, Curtis Cranes and Hoists have been in use in their foundry. Mr. Hanchett reports:

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(*Continued from Page* 75)
factory addition to its Twelfth street plant. (Noted March 4).

New Jersey

CARNEY'S POINT, N. J.—E. I. du Pont de Nemours & Co., 1007 Market street, Wilmington, Del., is contemplating an expansion program at its plant here.

CLIFTON, N. J.—Motors and other auxiliary equipment will be installed for reopening the Henry Doherty Silk Co.

Pennsylvania

OIL CITY, PA.—Knox Glass Associates Inc., care of Oil City Glass Bottle Co., Oil City, Pa., will remove its present equipment from Sheffield, Pa., here, and will build a 1-story, 20 x 175 foot addition. Machinery and equipment will be installed for decorating glassware.

PHILADELPHIA—Col. Gustave R. Lukesh, division engineer of the North Atlantic division, United States army engineers, here, states that the Electric Power Co. of New Jersey has filed with the federal power commission, Washington, petitions in regard to proposal to erect three hydroelectric plants at a cost of $29,000,000.

Michigan

DETROIT—General Screw Co. has been formed to deal in screw machine products, by Howard L Cooper, 477 Charlotte avenue.

DEARBORN, MICH.—Ford Motor Co. is having Giffels & Vallet Inc., 606 Marquette building, Detroit, prepare plans for a soy bean conversion factory, approximately 50 x 175 feet.

EATON RAPIDS, MICH.—City is contemplating expenditure of $190,000 for public improvements, including a sewage disposal plant.

FREMONT, MICH.—Fremont Canning Co. has completed plans for erection of an addition to its warehouse and canning factory.

GRAND RAPIDS, MICH.—Electro-Tool Inc., has been incorporated to deal in tools, by Walter M. Hanson, 921 Knapp street, Northeast.

KALAMAZOO, MICH.—M. C. Billingham, architect, is preparing plans for a $20,000 factory addition, 40 x 100 feet, to be erected here.

ROYAL OAK, MICH.—Nagel-Ryan Co. Inc. has been organized with $5000 capital to deal in machinery, by Walter S. Ryan, 4363 Woodward avenue.

SAGINAW, MICH.—Michigan Sugar Co. plans to spend $500,000 for improvements at six of its sugar mills.

TRENTON, MICH.—Trenton Valley Distillers Corp. has completed plans for a bottling plant, 50 x 150 feet, to be erected here.

Illinois

CHICAGO—Aetna Machine Works Inc., 4650 Iowa street, has been incorporated by Louis J. Brainerd, Fred M. Brainerd and Ray C. Brainerd, to manufacture and sell machinery and tools. Correspondent: Roy C. Holbrook, 105 West Monroe street.

CHICAGO—Marquette Steel Co., 2509 West Cermak road, has been incorporated by Phillip F. Ciral, Rose S. Ciral and Vincent J. Erb, to deal in iron, steel and other metals. Correspondent: E. D. Salinger, Hearst building, 326 West Madison street.

PEORIA, ILL.—Penn Maryland Corp., Peoria, Ill., care of National Distillers Corp., 120 Broadway, New York, plans to replace the blending and rectifying plant here recently damaged by fire. Cost is estimated at $150,000.

WAUKEGAN, ILL.—Board of trustees has set May 3 as the date for receiving bids on sewage treatment plants and intercepting sewers to be financed through a $238,000 PWA grant. The proposed improvements have been estimated in excess of $900,000.

Indiana

ANDERSON, IND.—To insure sufficient space for development and enlargement, the Greer Steel Co., Dover, O., which is erecting a strip steel plant here, has acquired ten additional acres adjoining the previously acquired factory site. The original site consisted of approximately 36 acres.

DECATUR, IND.—Steel Fabricating Co. has been formed by A. J. Gibbons, Indianapolis, president, and R. G. Herbig, secretary-treasurer, to manufacture tubing for the automobile industry. Arrangements are being made to lease a factory building here.

LAWRENCEBURG, IND — James Walsh Distilling Co. is planning construction of a 5-story, 20,000-barrel distillery warehouse, estimated to cost $10,000.

Kentucky

DANVILLE, KY.—City, R. E. West chairman of special council committee, is considering erecting a power plant.

FRANKFORT, KY.—Ralph Greenbaum Distillery Co. has been incorporated with $300,000 capital by Willard Rouse Jilson and John M. Perkins.

Alabama

ANNISTON, ALA.—Alabama Pipe Co. has reopened its Union Foundry plant and has employed 200 men on a three-day week schedule.

SHEFFIELD, ALA.—City, Stockton Cooke Jr. attorney, will soon call for bids for electric distribution system. PWA loan of $230,000 has been granted.

District of Columbia

WASHINGTON—Bureau of supplies and accounts, navy department, will open bids April 30, schedule 4818, for motor-driven pumps and spares, for delivery at Brooklyn, N. Y., Philadelphia and Charleston, S. C.

WASHINGTON—Veterans administration, Room 764, Arlington building, will take bids May 14 for construction of a water softening plant at the veterans administration facility at Canandaigua, N. Y.

WASHINGTON—Bureau of supplies and accounts, navy department, will receive bids April 25, schedule 4769, on motor-driven sensitive drilling machines, delivered Newport, R. I.; schedule 4771, motor-driven cylindrical grinder machine, delivered Philadelphia; schedule 4797, motor-driven gear cutting machine, delivered Portsmouth, N. H.

Georgia

SAVANNAH, GA. — Turpentine & Rosin Factors Co. plans to construct a refinery, stills and turpentine works with storage facilities at Statesboro, Ga. Cost will exceed $30,000.

Louisiana

NEW ORLEANS — Sewerage and water board has approved plans and specifications and will call for bids on sewerage extension and construction of pumping station. Project includes constructing sewage pumping station, installing pumps, motors, switchboards, transformers, etc., and furnishing and installing power cable.

Mississippi

BILOXI, MISS.—Standard Oil Co. of Kentucky, 430 West Bloom street,
(*Please turn to Page* 79)

FAMOUS LANDMARKS

Washington has the CAPITOL

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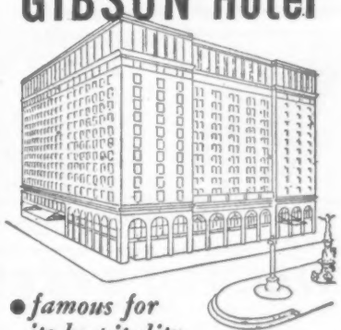

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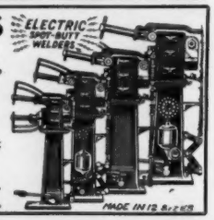

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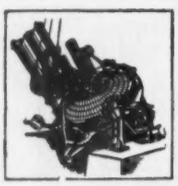

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(*Concluded from Page 77*)

Louisville, Ky., is considering erecting a plant with capacity of 60,000 barrels of oil and other products, and will build docks, warehouse and install tanks.

North Carolina

GREENSBORO, N. C.—Southern Packing & Canning Corp., W. C. Shaw president, 226½ West Market street, is planning to establish a cannery in a building on Commerce street.

SEVIER, N. C.—Lumber plant of M. L. Good Co. recently sustained severe damages by fire.

WILLIAMSTON, N. C.—Saunders & Cox, Washington, are planning to erect a new mill here, at a cost of $25,000, including equipment. A band mill and one 72-inch x 18-foot HRT boiler, hog, and filing room equipment will be installed.

WINSTON-SALEM, N. C.—Winston Leaf Tobacco Storage Co., 221 West Twelfth street, is erecting an addition, 15 x 220 feet, to its present building; an addition to the boiler room, 14 x 40 feet; and also will install a drying machine and other equipment.

South Carolina

COLUMBIA, S. C.—Lott-Wilks Machinery Co. has been capitalized with $10,000 to deal in machinery and equipment, by V. D. Lott, president, and J. W. Wilks, vice president.

Tennessee

KNOXVILLE, TENN.—Director of purchases, Tennessee Valley Authority, will receive bids April 29 for one 270-ton gantry crane and one 20-ton gantry crane for the Wheeler power plant, and one 350-ton traveling crane for the Norris power plant.

SHELBYVILE, TENN.—Ray Box Factory, T. L. Jack Proprietor, Main street, has acquired a site for erection of a plant, 50 x 125 feet, to double present output.

West Virginia

CHARLESTON, W. VA.—West Virginia Brewing & Ice Co. has been incorporated with $750,000 capital by H. G. Smith, Parkersburg, W. Va., and associates. Breweries may be established at Bluefield and Charleston.

GRANVILLE, W. VA.—Cochran Coal & Coke Co., Dawson, W. Va., will build coal loading dock on the Monongahela river near here.

Virginia

COVINGTON, VA.—Property of the Covington Machine Co., Covington, Va., consisting of land and buildings, machinery and equipment, will be sold at public auction May 1. Sale is under management of Industrial Plants Corp., 90 West Broadway, New York.

Missouri

LOUISIANA, MO.—City is taking bids May 1 on waterworks improvements to include a filter plant. Work has been estimated at about $150,000.

LOUISIANA, MO.—City receives bids May 1 for furnishing and constructing water supply and purification system, consisting of pumping equipment and apparatus installed complete, filter equipment, engine and generator units, piping, valves and fittings and switchboard and wiring.

PLATTONSBURG, MO.—City will receive bids for erection of generating plant and distribution system, costing approximately $50,000.

ST. LOUIS—Small Mfg. Co., maker of packaging machinery, is erecting a $14,000 plant at 1204 Ferguson avenue. W. J. Kenton, 3626 Jasconade street, is contractor.

Arkansas

HOPE, ARK.—J. I. Williams & Sons Inc. is rebuilding its saw mill unit at a cost of $16,000.

LEACHVILLE, ARK.—City, Bob Eblen mayor, has completed plans for a $46,500 waterworks system.

WILSON, ARK.—Memphis Compress & Storage Co., T. L. Green secretary-treasurer, Cotton Exchange building, Memphis, Tenn., will construct a $100,000 compress and warehouse near here.

Texas

HOUSTON, TEX.—City, J. P. Lindsay mayor, will receive bids May 3 for improvements to waterworks, including tank and tower, deep well and pumping equipment. Fund of $50,000 has been allocated for this project. M. C. St. John, 425 Esperson building, city engineer.

SAN ANTONIO, TEX.—Firestone Tire & Rubber Co., Akron, O., is receiving bids for a gasoline bulk plant. Work includes installing three underground tanks, of approximately 15,000 gallon capacity, and constructing a corrugated sheet metal pump house.

SAN ANGELO, TEX.—Texas Woolen Mills Corp., in process of organization by M. C. Cotton, 202-203 Burt building, Dallas, Tex., is planning to erect a plant here. About $1,000,000 will be spent, including building and machinery. E. B. Boyd, 1806 20 avenue, South, Nashville Tenn., is in charge of selecting machinery.

Wisconsin

LACROSSE, WIS. — Allis-Chalmers Mfg. Co., Milwaukee, through its tractor implement and plow manufacturing division here, has purchased the former wagon plant of the Smith Mfg. Co., consisting of a site 150 x 350 feet, with a building, 75 x 150 feet, which is to be razed. While no announcement has been made of early building operations, it is believed that eventually some will be undertaken.

MILWAUKEE—Department of public works will take bids until May 2 for mixing equipment and drainage pumps for the coagulation basin of the new $4,500,000 municipal waterworks filter plant. J. P. Schwada is city engineer.

MILWAUKEE—Sadek Bros. Inc. has been organized by M. Sadek, to deal in metal specialties and iron and steel products. Mr. Sadek formerly was associated with the Miller Iron & Metal Corp.

Colorado

COLORADO SPRINGS, COLO.—Voters in the April election approved a bond issue of $225,000 for construction of sewage disposal plant.

GREELEY, COLO.—In the spring election, voters approved $60,000 in bonds for sewage disposal plant. (Noted Feb. 11).

Idaho

OROFINO, IDAHO — Washington-Idaho Lime Products Co. plans to construct a plant here and install equipment, at a cost of about $100,000.

Pacific Coast

LOS ANGELES—Wilshire Oil Co., 2455 East Twenty-seventh street, has awarded to the Ralph M. Parsons Co., Mt. Vernon, O., the contract for erecting a refinery at Santa Fe Springs, Calif. Boilers, fire protection system and other auxiliaries, as well as a refining plant, will be installed. Work is under way.

SANTA MONICA, CALIF.—Expansion of the Douglas Airplane Co.'s plant is assured, following a majority vote cast by Santa Monica residents in favor of a proposition which will allow the city to deed 10 acres to the company. Plans call for the erection of an additional factory building.

STOCKTON, CALIF.—Inland Trailer Co., 822 East Church street, has begun the manufacture of regular and heavy-duty commercial trailers and attachments. According to C. W. Harris, proprietor, the company will later also manufacture diesel-electric, streamline passenger buses.

MARSHFIELD, OREG. — Cypress Fisheries Inc. is building the first unit of a $60,000 fish reduction plant, and plans to add a cannery later. M. L. Richardson is in charge.

PORTLAND, OREG.—Western Steel Equipment Co. has taken over the former plant of the Pacific Car & Foundry Co. at 734 Northeast Fifty-fifth avenue for expanding its facilities. The company now is able to furnish a complete line of railway car and locomotive equipment and supplies, air equipment, tools, etc.

SPOKANE—Nelson Bros., Co., 408 East Sprague street, has been incorporated with $15,000, to deal in machinery.

SPOKANE—Combination Mining Co. has been incorporated with $50,000 capital, by W. A. Graham and associates, 315 Pacific avenue.

SPOKANE—City is preparing plans for a $300,000 pumping plant, and later intends to expend $445,000 in main extensions to the municipal water system.

SPOKANE—Allocation of $625,000 city funds has been provided to finance a dam and hydroelectric plant at the Spokane river station.

VANCOUVER, WASH.—Plans are completed for a district headquarters building for the state highway department, to include machine shops, repair plant and supplies for road machinery and equipment.

Dominion of Canada

CALGARY, ALBERTA—Bell Refining Co. Ltd. is planning to build a refinery to have a daily capacity of 2000 barrels of crude oil, and a 175,000-gallon tank.

EDMONTON, ALBERTA—North Star Oil Co. Ltd. has purchased a site here and plans to construct a refinery. Estimated cost $40,000.

TRAIL, B. C.—Consolidated Mining & Smelting Co. of Canada Ltd. is proceeding with construction of a sulphur recovery plant. The plant, costing approximately $2,500,000, will increase the production of sulphuric acid and will also produce elemental sulphur for the market.

HAMILTON, ONT.—Dominion Foundries & Steel Ltd., Depew street, is having plans prepared by Fred Prack, architect, 1316 Pigott building, Hamilton, Ont., for a tin plate mill, including tinning unit and warehouse, pickle building and boiler house. Cost is estimated at $50,000.

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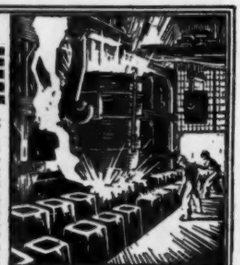

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